NEW ZEALAND JOURNAL OF Agriculture

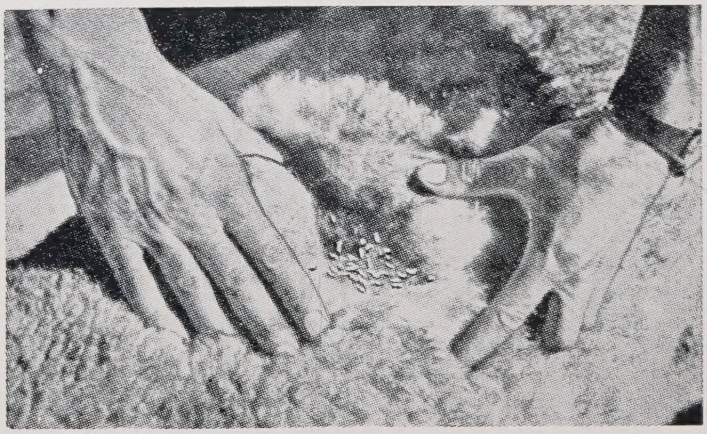
AUGUST - 1952

22 OCT 1952

FARM BULLETIN published by COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD.
World famous Manufacturers of Sheep Dips, Worm Drenches and other Stock Remedies.

No. 25 PUBLISHED EVERY SECOND MONTH August, 1952

Latest Treatment for Fly-Struck Sheep



COOPER'S MAGGOT DRESSING

This combines "Gammexane" (B.H.C.) and D.D.T. in specially processed form. Cooper's Maggot Dressing differs from all others in that besides killing newly hatched maggots, *it expels the larger ones from the fleece* instead of leaving them to putrify and attract more flies. Moreover, it protects the wound against restrike and assists healing. Other advantages are that it does not stain the fleece or cause irritation or "burning" either of the sheep's skin or operator's hands.

COOPER'S MAGGOT DRESSING

is *NEW* and

OUTSTANDINGLY EFFICIENT

Available in one gallon drums and 16oz. tins. 1 part is mixed with 19 parts water. A 16oz. tin makes 2 gallons of Maggot Dressing.

Branding without Mess or Wastage

FLEXOPAD

Users confirm that the FLEXOPAD Automatic Brander takes the mess and wastage out of the branding operation and quickly pays for itself in saving of branding fluid, time and labour. It is only necessary to fill the reservoir with fluid and something like 400 sheep can be branded without handling the fluid again or wasting a drop. Your stencil brand is cut on the face of a leather pad underneath—a job any saddler can do for you or you can do it yourself. A firm pressure on the animal leaves a clear-cut, lasting brand. Get a FLEXOPAD and benefit by it every time you brand.
Over 4000 satisfied users in New Zealand.
PRICE 55/-.

Prevention of FLY STRIKE

For the PREVENTION of strike, there is now available a new and highly effective preparation also containing D.D.T. and "Gammexane" (B.H.C.).

COOPER'S POWDER FLY SPRAY

This gives at least 5 to 6 weeks protection with one treatment at a cost of about 3d. per head. Cooper's Powder Fly Spray should be used at the onset of a fly wave or better still, systematic sprayings undertaken each year at a time immediately prior to the date at which fly is normally expected.
Five 2lb. packets make 100 gallons of spray which should be sufficient for upwards of 400 sheep. Bucket pumps or power units can be used.

DAIRY OINTMENT with Great Advantages

COOPER'S DAIRY OINTMENT is NOT "just another dairy ointment". It possesses unique qualities that make it entirely different from anything else in its field. Its exceptionally powerful bactericidal properties enable it to destroy the bacteria most commonly associated with mastitis and also the pus-forming bacteria which cause wounds to suppurate. In physical make-up it is as smooth as vanishing cream and it has the outstanding feature of mixing with water, enabling it to readily penetrate wounds with a watery discharge, and not merely form a skin over them.
COOPER'S DAIRY OINTMENT will not taint milk.
Available in 2lb. tins from Dairy Companies, Stock and Station Agents and Merchants.

Drenching with Ease and Accuracy

VICTOR DRENCHING GUN

The drenching operation is vastly simplified and tedium removed if you use a VICTOR GUN. Outstanding features of this excellent gun are its accuracy, simplicity, light weight and sturdy construction. Designed for Phenothiazine, nicotine-sulphate and all water-based drenches. The pistol is calibrated up to one fluid ounce, and if larger doses are required it is simply necessary to give two light pressures.
PRICE £11 (subject to alteration).

All the products featured on this page are obtainable from Stock and Station Agents and Merchants, or write to:
COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD., Box 599, Auckland.

Volume 85
Number 2
15 August
1952.
(Established 1910)

NEW ZEALAND JOURNAL OF Agriculture

Published by
Direction
of
Hon. K. J. Holyoake,
Minister of Agriculture.

This Month's Cover

Alexandra, one of the principal towns of Central Otago, is shown in this month's cover, which has been reproduced from an Ektachrome (Kodak (N.Z.) Ltd.) photograph by T. Lloyd. Established as a gold-digging settlement, Alexandra is now best known for its stone fruit, though a gold dredge still operates there. Irrigation is widely used on the orchards and fat-lamb and dairy farms of Central Otago and the climate favours the production of cereals and small seeds in some parts. Extensive farming, chiefly for wool production, is practised on large areas of tussock and depleted grassland, which are of low carrying capacity. Low rainfall (the average annual fall for Alexandra is 13.22in.) has always been the chief factor limiting farming operations in Central Otago.

New Zealand Department of Agriculture
HEAD OFFICE:
Dominion Farmers' Institute Building,
Featherston Street, Wellington.

DIRECTOR-GENERAL:
E. J. Fawcett
ASSISTANT DIRECTOR-GENERAL:
R. B. Tennent
DIVISIONAL DIRECTORS:
Animal Industry .. .. J. E. McIlwaine
Animal Research .. .. J. F. Filmer
Dairy .. .. H. A. Foy
Extension .. .. P. W. Smallfield
Horticulture .. .. A. M. W. Greig

Editor: G. J. Neale

TABLE OF CONTENTS

The Menace of Foot and Mouth Disease 99
Elevated-bail System of Milking Incorporating Tandem Bail .. W. G. Batt .. 101
An Easily Handled Field Loader for Bulk Lime .. C. J. Crosbie .. 105
Hagerdoorn System of Poultry Breeding .. J. H. Jones .. 107
Management of Glasshouses .. R. R. White .. 109
Survey Shows Decline in Use of Pampas Grass .. S. H. Saxby .. 114
Sleepy Sickness and Milk Fever in Ewes .. J. C. Gerring .. 115
Increased Prices Incentive to More Pig-meat Production .. A. Longwill .. 119
Rust of Linseed and Linen Flax: Life Cycle and Control .. I. A. M. Cruickshank .. 123
Shallots: An Easily Grown Crop in Home Garden A. G. Kennelly .. 125
Management of Perching Pullets 127
Pedigree Sow Records 128
Recent Research Work: Wheat 129
Responsibilities of Beekeepers .. D. Roberts .. 131
Selection of Dairy Herd Replacements .. G. R. Mackintosh .. 133
Radio Broadcasts 134
Shelter in Citrus Orchards .. J. E. Hume and F. L. Bailey .. 135
Care of Livestock during September 142
Dairy Produce Graded for Export 142
Spring-sown Crops and Pastures: Drain Maintenance (Seasonal Notes) 143
Farming Potential as Guide to Land Planning .. R. H. Scott and and R. T. du Faur 144
Meteorological Records for June 150
The Influence of Hygiene on the Health of Livestock .. G. V. Wallace .. 151
Types of Farming Practised in New Zealand .. W. N. Paton .. 159
The Home Garden .. C. L. Napier .. 161
The Basis of Disease Prevention on the Poultry Farm .. J. J. Thompson .. 169
Scented Shrubs .. M. J. Lockie .. 173
A Smart Knitted Jumper in Contrasting Colours 177
Sponge Cakes .. Molly Macpherson .. 178
The Flower Garden .. C. K. Ellis .. 183
Pleasanter Ironing Days .. Maud B. Strain .. 187
Baby's Dress and Matinee Jacket 191

SUBSCRIPTION RATES

The "Journal" is issued monthly. The subscription within New Zealand is 10s. a year; the overseas subscription is 13s. (sterling). The "Journal" may be ordered from any bookseller or newsagent, or direct from any office of the Department of Agriculture. Individual copies are available from Publications Section, P.O. Box 2298, Wellington, at 1s. a copy, post free.

Subscription inquiries (preferably accompanied by the address cut from a recent "Journal" wrapper) should be sent to the nearest office of the Department of Agriculture.

COPYRIGHT PROVISIONS

Articles in "The Journal of Agriculture" are copyright, but may be reprinted, provided **both the "Journal" and author are acknowledged.**

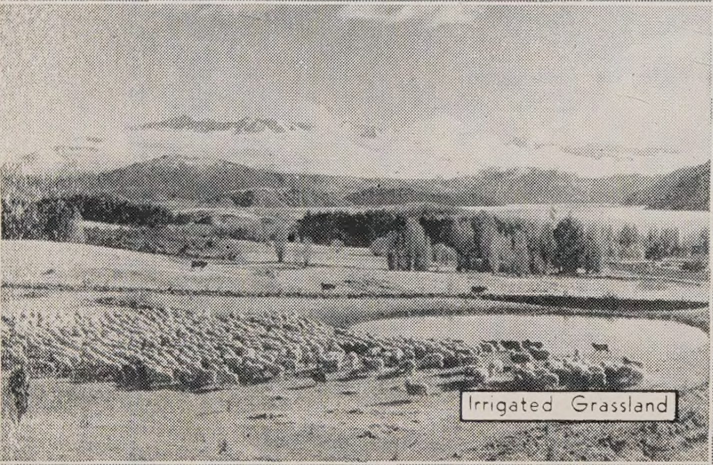
The Minister of Agriculture does not accept responsibility for any of the private and trade advertisements included in this publication.

All correspondence relating to the "Journal" should be addressed to the Editor, "The New Zealand Journal of Agriculture", P.O. Box 2298, Wellington.

REGISTERED AT THE G.P.O., WELLINGTON, AS A MAGAZINE.

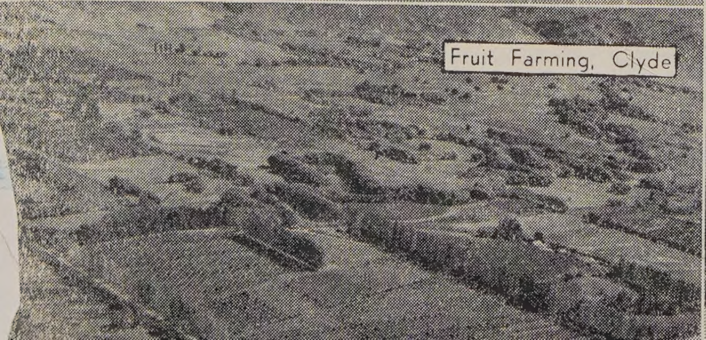
CENTRAL OTAGO

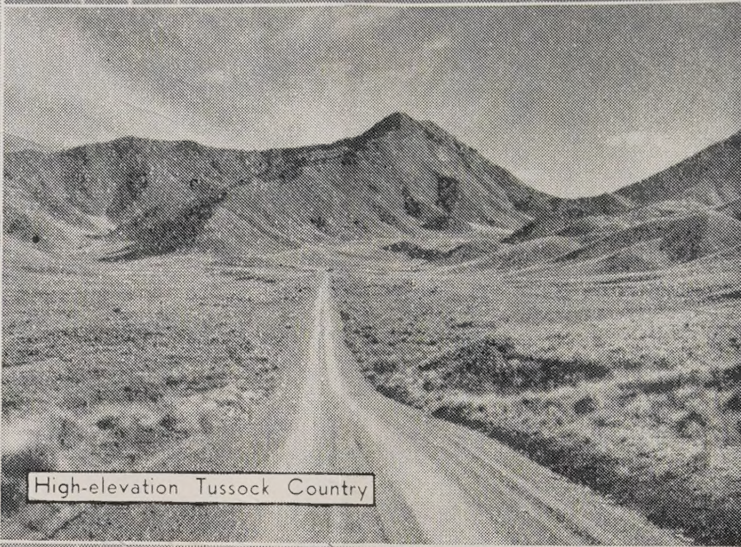
Cropping, Hawea Flat

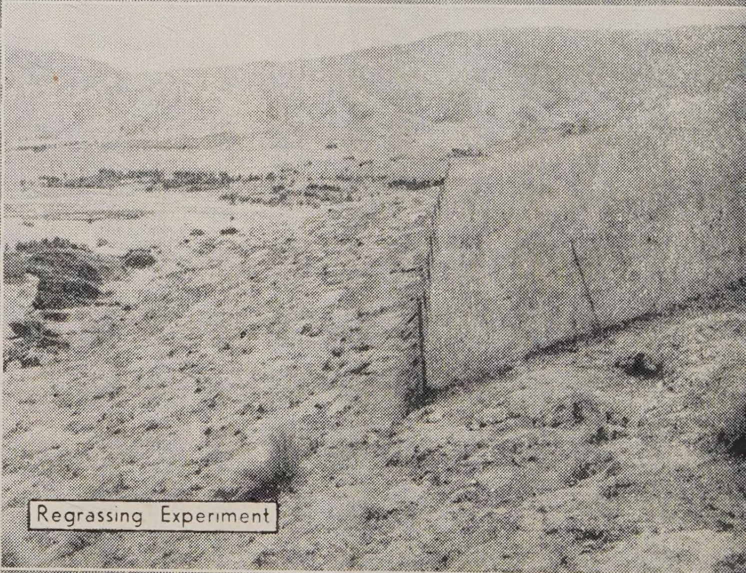

Irrigated Grassland

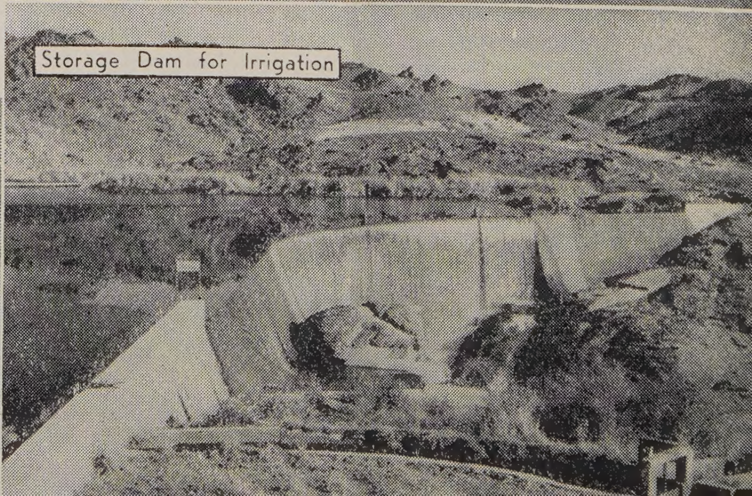
As the importance of goldmining decreased in Central Otago so did the intensification of farming increase, being made possible only by the construction of irrigation schemes. Large areas which could be irrigated beneficially have enabled orchards and good fattening pastures to be established. Though most of the tussock country at the higher elevations is in good condition, the greater part of the lower country is depleted.

[Photographs by V. C. Browne, N. R. Lewers, and "Weekly News".


Fruit Farming, Clyde


High-elevation Tussock Country


Regrassing Experiment


Storage Dam for Irrigation

The Menace of Foot and Mouth Disease

THE serious outbreaks of foot and mouth disease which have occurred in Europe, Britain, and Canada in recent months have caused thousands of head of stock in those countries to be destroyed and in addition have brought considerable economic losses to farmers through their inability to market animals as the result of embargoes which have been placed on stock movements.

Because it is highly contagious and is therefore spread with extraordinary ease and rapidity, foot and mouth disease can be a scourge to every country whose economy is linked with a livestock industry. Its establishment in our herds and flocks would be disastrous and for that reason stringent precautions are being taken to prevent it from reaching us. These precautions may seem irksome to some, particularly travellers, but they are dictated by the grave consequences of the introduction of foot and mouth disease to the Dominion.

Effect of Air Travel

One of New Zealand's most important assets is freedom from serious epidemic diseases of stock. An important factor in this freedom has been, until recent years, our isolation from sources of infection in different parts of the world. The development of air travel, which now places us only days away from other countries instead of weeks, has largely removed the safeguard of isolation and has increased our susceptibility immeasurably. The responsibility for keeping virulent animal diseases, of which foot and mouth disease is undoubtedly the most dangerous, from our farmlands has thus now become of far greater significance.

Foot and mouth disease affects cattle, pigs, sheep, and goats, and deer and other ruminants are susceptible. Hedgehogs can be readily infected and rats and rabbits less easily; dogs, cats, and fowls and other birds can be mechanical carriers. It is obvious what a menace this disease would be if wild life became infected and spread it throughout the country. Moreover the considerable and continual movement of stock which is part of our highly developed farming system would add considerably to the difficulty of controlling an outbreak.

Early Identification of Great Importance

Early identification of the disease by farmers is of great importance in controlling foot and mouth disease, and the principal symptoms are easily recognised, though similar ones can be produced by other conditions. These symptoms were described in last month's issue of the "Journal of Agriculture" and in a leaflet about the disease issued by the Department of Agriculture. I cannot emphasise too strongly that all farmers should learn the characteristics of these symptoms so that in the event of an outbreak they can recognise an affected animal immediately and report the case without delay to their nearest veterinary surgeon, Livestock Instructor of the Department of Agriculture, or police station.

Persistence of Infection

The most dangerous feature of the disease is the length of time infection can persist on contaminated material—several months in mud and on hay, straw, sacking, and similar material and much longer in frozen meat or on bones from animals carrying the infection and slaughtered for food.

Importations of susceptible animals are now being permitted only from Australia, where the disease does not exist. Though farm animals exported from Britain normally have to be isolated in official quarantine stations in both Britain and New Zealand, have to be given official veterinary tests, and have to be certified as healthy in Britain and in New Zealand, it has been decided as a safeguard that in the meantime no livestock susceptible to the disease will be shipped from Britain to New Zealand.

As it is considered that the disease could spread to New Zealand only through the entry of contaminated objects or material, including plants, the precautions now being taken are intended either to exclude all possible infective material from entry or to have it disinfected. Importation of material likely to harbour the virus from countries where foot and mouth disease is known to occur is strictly controlled. Hay, straw, and similar materials used for packing goods and second-hand sacks are media for the introduction of the disease and action has been taken to tighten the conditions governing the use of them. Furthermore Cabinet has agreed to the drafting of a Bill which is to be presented to Parliament this session to extend the provisions of the Stock Act regarding substances which can introduce animal diseases and to provide power to requisition the services of suitable persons to assist in carrying out the measures necessary to limit and stamp out an outbreak of any serious disease of livestock.

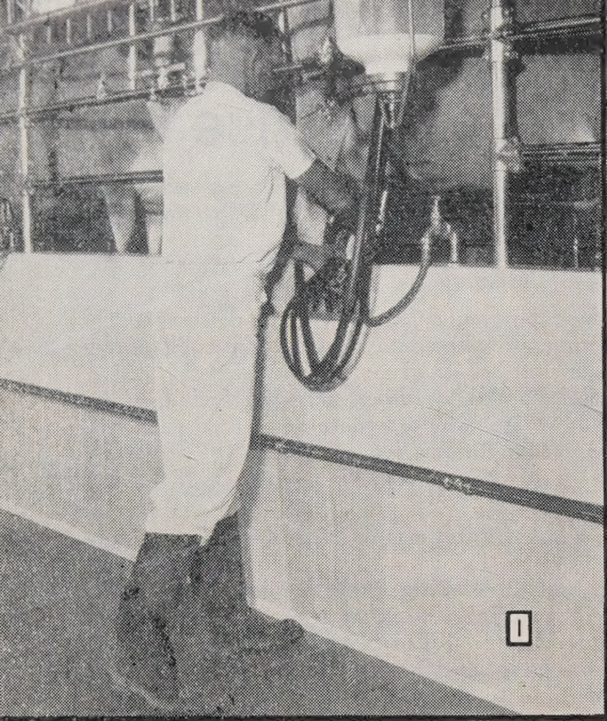
Garbage from overseas ships is another serious risk, but regulations under the Stock Act forbid its entry.

Latest Control Methods Investigated

Shortly after the British outbreak became serious the Government recognised the need for obtaining knowledge of the latest methods of dealing with foot and mouth disease in overseas countries, and it arranged for the Director of the Animal Industry Division of the Department of Agriculture (Mr. J. E. McIlwaine) to visit America, Canada, Britain, and Europe and to confer with research workers and veterinarians there. This officer recently returned to New Zealand and the up-to-date information he has obtained is being disseminated to all our veterinarians and Livestock Instructors. The Dominion is thus fully prepared to combat this dreaded disease if we should be unfortunate enough to have an outbreak.

K. J. HOLYOAKE, Minister of Agriculture

ELEVATED-BAIL MILKING PREMISES


1

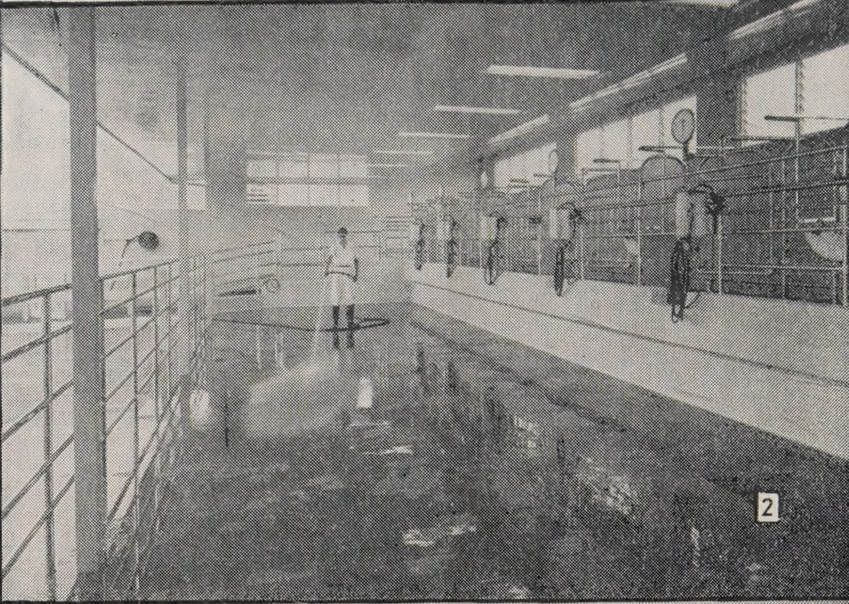
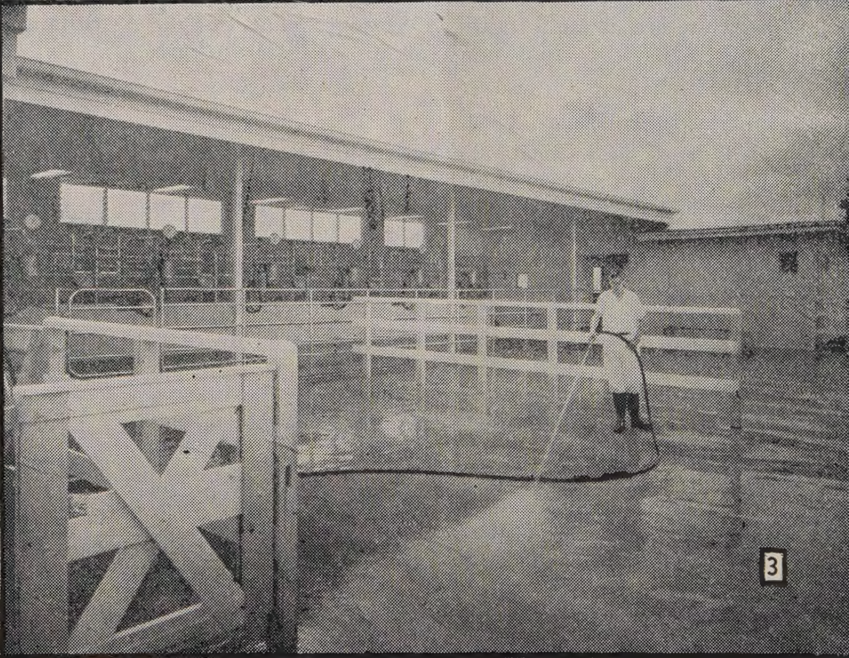
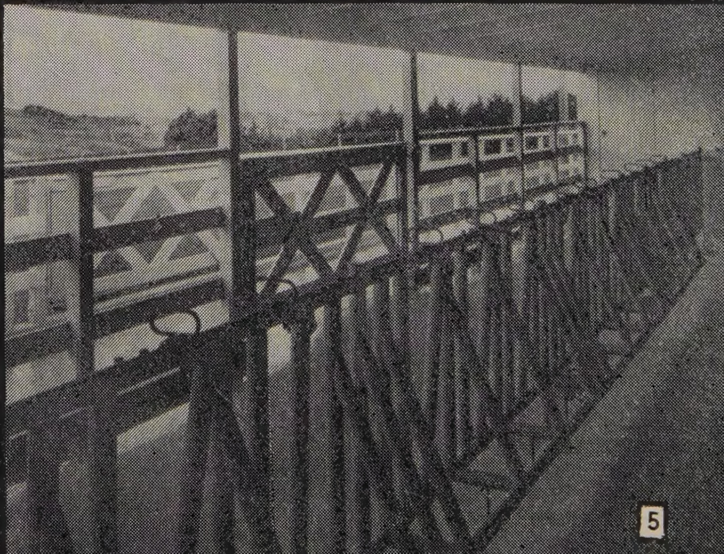
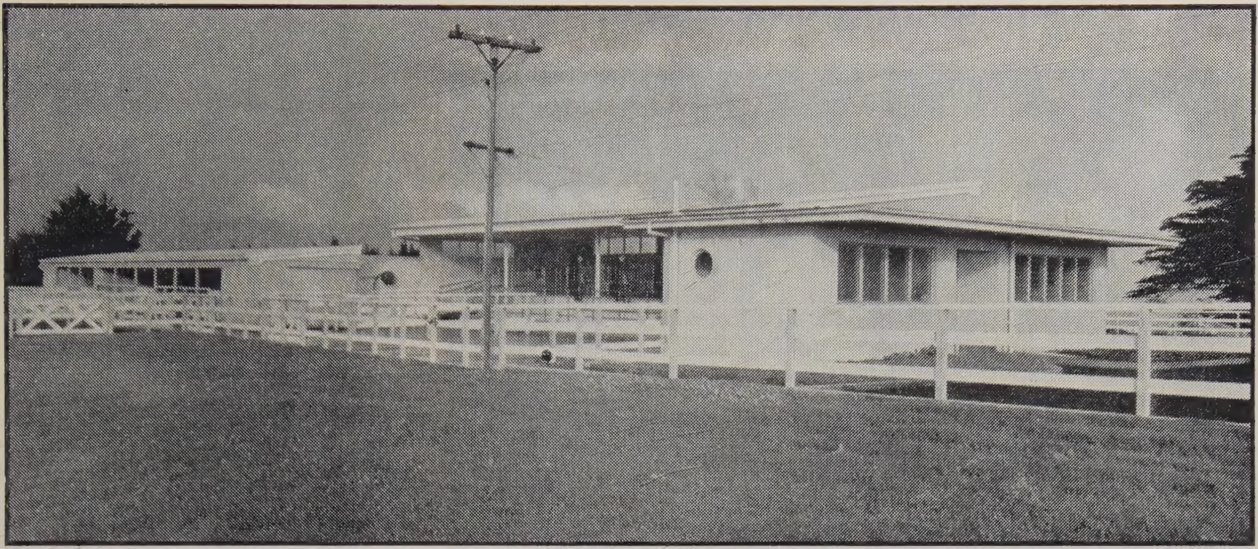

2

Fig. 1—The simplicity of milking is shown by the upright position of the operator when removing the teat-cups. Fig. 2—The milking shed interior, showing the raised platforms and elevated bails. The up-ramp is in the background. Fig. 3—The holding yards. They were specially constructed to divert cows to the up-ramp. Fig. 4—The herd entering the yards by the long concrete control race, which provides permanently satisfactory surroundings. The automatic foot bath is shown in the foreground and the diversion gates for the alternate discharge of liquid manure and storm-water are on the right. The lean-to building in the foreground houses the calf-feeding bails and hospital. Fig. 5—The interior of the calf-feeding bails. Feed cans are supported on a pipe under the bails, leaving the floor unobstructed.


3

4


5



HEADING PHOTOGRAPH: General view of the dairy premises. The calf-feeding bails, hospital, and show-stock housing are on the left.

Elevated-bail System of Milking Incorporating Tandem Bail

DAIRY farmers throughout the Dominion, particularly those who have considered stoopless milking, will be interested in a new type of elevated-bail milking shed constructed for Mr. C. G. Prevost, of Manurewa, near Auckland, whose property has been developed in two areas, one as a pedigree Jersey stud and the other with pedigree sheep. The principal features of the elevated-bail milking premises on Mr. Prevost's dairy property are discussed in the following article by W. G. Batt, Supervisor of Farm Dairy Instruction, Department of Agriculture, Hamilton, who planned the layout of the premises to adapt the elevated-bail system of milking to a milking shed suited to New Zealand conditions.

THIS planning was made possible by a study of the elevated-bail systems used in America, and their adaptation in this form is likely to be the most suitable method for introducing stoopless milking to New Zealand.

Stoopless Milking

Stoopless milking has been of interest to many New Zealand dairy farmers for several years, and interest was increased during and after the visit of Professor W. E. Petersen, of Minnesota, U.S.A., in 1948, when he said the method was likely to increase in his country. What has been sought is a method of milking in which operators can work upright and do not have to stoop during the manipulation of teat-cups or in stripping where it is practised. (See Fig. 1.)

Attempts to provide such a form of milking have been made by individuals in New Zealand for many years, but without any prominent success. The several methods used in the United States have been studied by the Dairy Division, but have not been regarded as altogether suitable to New Zealand conditions, the essential difference being that the climate in most dairying districts in the United States makes the use of the closed-in type of shed popular in New Zealand the climate lends itself to the construction of an open-fronted shed permitting a greater circulation of air and admission of sunshine.

Raised Floor for Cows

Stoopless milking can be provided only by raising the cows to be milked above the floor used by the operators or by the operators working from a well or floor below that used to stall the animals. (See Fig. 2.) Some New Zealand farmers have attempted to provide the former method by constructing within common dummy bails raised platforms which are reached by the cows stepping upward or travelling upward from small ramps. This method has not proved satisfactory, as it has not been possible to obtain sufficient height. To provide the alternative it has been usual to construct a sunken well from which the operators work between two rows of cows in a race type of shed. A suggested alternative to the sunken well has been to construct an operators' platform under the floor of a standard open-fronted shed so that the milkers can operate the teat-cups from protected openings in the floor between the cows. These protected openings provide the dummies, but obviously this method is suitable only on undulating or hilly country.

Disadvantages

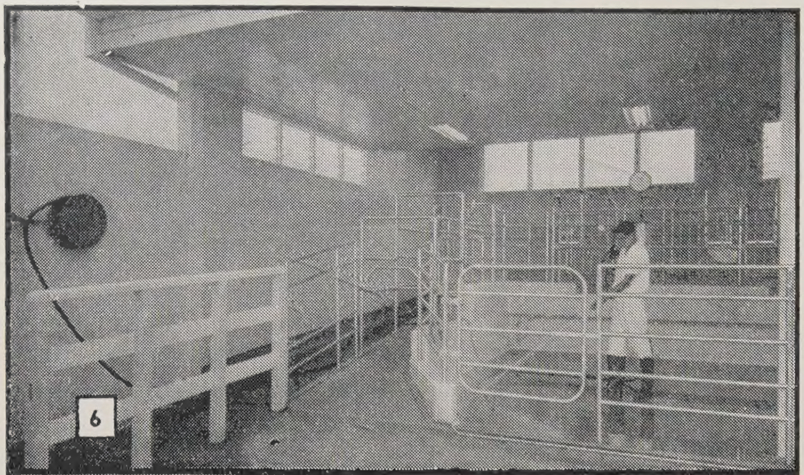
Each of these methods has disadvantages, and they make efficient cleaning inconvenient and a high standard of hygiene difficult to maintain. None can be recommended, and the sunken-well race type is regarded as the poorest of any method attempted, despite its use to some extent in America. Apart from the difficulties of cleaning and poorer ventilation, it has all the disadvantages of the race type of milking shed now obsolete.

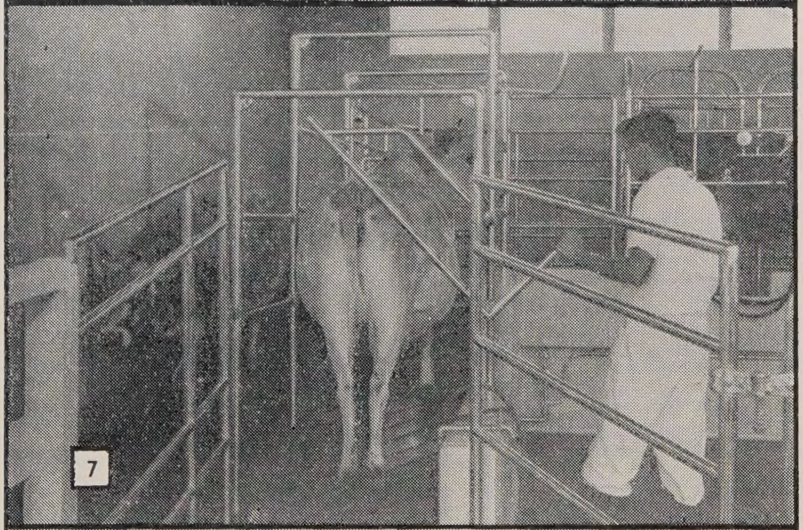
Such disadvantages include the slowing up of milking operations, as fast-milking cows cannot be discharged until slow-milking cows which may be in the race ahead are completed, and by the access of the operators being restricted by the milking machine parts which are suspended between the two rows of cows. These difficulties are further complicated in the sunken-well type, as the operators have the added inconvenience of stepping in and out of the well if they assist with the bailing operations.

Elevated-bail Premises

Knowing the interest of farmers in stoopless milking, the Dairy Division has been anxious to see developed in New Zealand a milking shed suitable to conditions here but adapted to feature this innovation. The opportunity was presented by Mr. Prevost's requesting assistance in planning the construction and layout of up-to-date premises of the highest possible standard and featuring the latest-known improvements and innovations. (See Fig. 3.)

In the preliminary discussions Mr. Prevost intimated that he required milking premises comparable with the American milking parlours and he readily agreed to the suggestion to adapt the New Zealand type of milking shed to the elevated-bail system of milking becoming popular in the U.S.A. Much credit is due to Mr. Prevost, because he has spared no expense in this construction, and he mentioned at the outset that he would





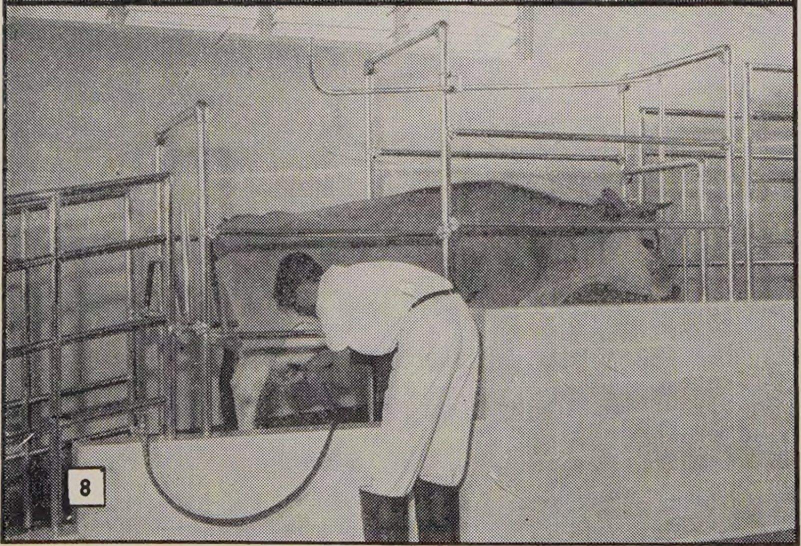


Fig. 6—Showing the up- and down- (against wall) ramps by which the cows reach and leave the raised platform. Fig. 7—Cow entering the washing bail on the up-ramp. The cow at left is leaving the raised platform by the down-ramp. Fig. 8—Udder washing in the washing bail on the up-ramp before the cow reaches the raised platform.

provide the finance to introduce any method or innovation that might be available anywhere in the world if the Dairy Division considered its adoption would provide an example to New Zealand dairying.

Internal Return Race

As a result, the tandem elevated-bail system was selected and plans and sketches were drawn to fit these bails on an elevated platform 2ft. 6in. above the floor level of the standard New Zealand open-fronted type of shed. In America the cows leave the milking premises at the point of discharge from the elevated bails and the raised platform has a width of 6ft. In Mr. Prevost's building it was thought desirable to confine the exit of cows within the building and a return race was constructed to link with the main control race, which increased the width of the raised platform to 9ft. This means that if tandem bails are adapted in this form to the New Zealand type of shed, a raised platform 9ft. wide is required if the exit of cows is confined within the building and one 6ft. wide if the exit of cows is by an external race. (See Fig. 9.)

The raised platform extends the length of the building and a space of 8ft. is required for each cow. The total length is increased by the 6ft. required for the entry and exit races. The cows reach the elevated platform by a 3ft. wide ramp at the end of the shed, as shown in Figs. 7 and 8, and on reaching the higher level they turn to enter whichever tandem bail is empty. On the up-ramp is placed a washing bail, which ensures convenient udder washing in a stream of clean water from the hose tap provided. On being milked the cows turn left from the tandem-bail race and return by the internal exit race at the back of the building and the down-ramp to the main control race and the pastures intended for them.

Flooding of Floor

The floor of the raised platform is kept flooded by a stream of water flowing evenly over the surface from a perforated pipe fitted behind the protecting kerb, and this reduces dust, assists keeping the premises cool, and immediately removes any manurial deposits. Such provision is also made in the main holding yard.

The up-ramp has a grade of 1ft. in 6ft., the cows being raised the required 2ft. 6in. in travelling 15ft. (See Fig. 6.) The down-ramp has an easier grade, about 1ft. in 9ft. 6in., and this provides the drainage fall from the raised platform. The front of the raised platform is protected by a dwarf wall 12in. high, reduced by 6in. at convenient points to provide for the manipulation of teat-cups. The drainage is taken in one straight fall to the back of the building and discharged along the return exit race and down-ramp. Thus the shed type conforms to New Zealand standards and conditions, with the exception that the cows face the releaser room end of the building during milking rather than the back of the shed as is usual.

High Standards

Every effort has been made to provide permanently satisfactory surroundings, the cleanest possible air supply, and every convenience in equipment and design to provide the highest possible standard of hygiene. To this end the premises and layout have been designed in a practical way, although no expense has been spared to ensure the highest standard. The layout features the permanent control of cows by their entry and exit to and from the yards on a concrete race, as now advocated by the Dairy Division, but in this case the race is 150ft. long. No drains are used and the drainage fall is in one direction from the releaser room to the near end of the race, from which point it is taken to a liquid manure cistern. At the drainage outlet an automatic foot bath (see Fig. 4) is provided and is controlled by gates to the two drains carrying storm-water and liquid manure respectively.

The premises are designed to handle 100 cows. All floors, with the exception of those used by the cows, are made of red mat tiles and all walls are of cream tiles to a height of 6ft. The bails and race partitions are of chromium-plated piping and the interior of the releaser room is fitted with stainless steel equipment and coverings. It is not suggested that these features should become standard in New Zealand farm dairies, but they are necessary to the high standard required in this case. (See Fig. 13.)

Calf Bails and Hospital

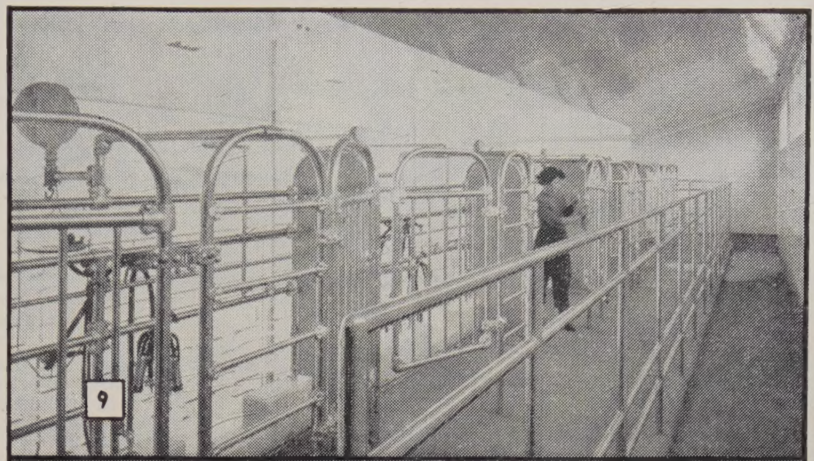
Calf-feeding bails and a calf hospital are constructed adjoining the race and are of modern design. The lean-to, open-fronted building housing them faces the race in a northerly aspect, providing protection from weather and the greatest penetration of sunlight. (Fig. 5.) The floor falls toward the race and this provides convenient cleaning, as the drainage links with the main system.

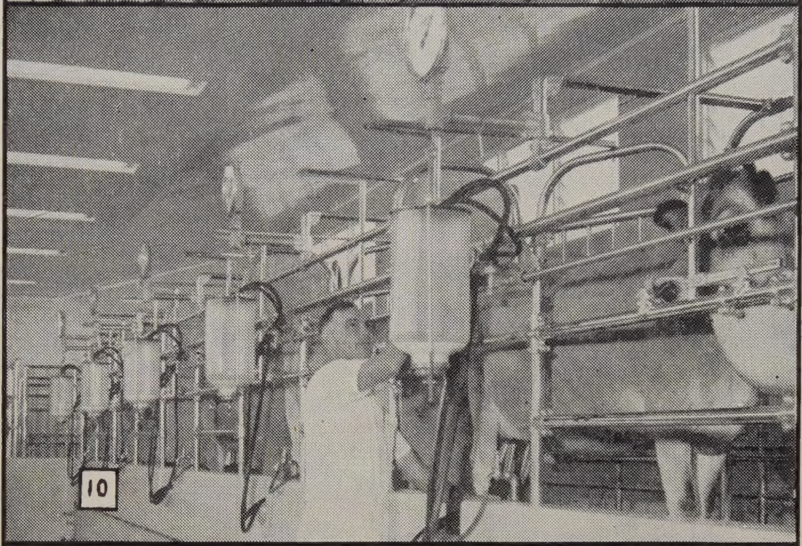
A milking machine was imported from America, not because it was regarded as superior to those made in New Zealand, but because it was available in stainless steel. All parts, including the teat-cups and claws, are made from this material. The machine also has automatic weighing devices, which can be seen in Fig. 10. The weight of milk from each cow is indicated on the scale dial, and after it has been recorded the turning of a 4-way tap discharges the milk from the glass weighing chamber into the main milk line and releaser. A drip sample for testing can also be taken if required.

Advantages of Tandem Bails

Of the different kinds of elevated bails used in America, the tandem type are most suitable to New Zealand conditions and provide the speediest milking. Although they require an extra 3ft. race space compared with the stall-type bail, they have the advantage that a quick-milking cow can be discharged immediately when milked. In the stall-type bails and in the ordinary race shed as used in New Zealand the discharge of a quick-milking cow is frequently hampered by slower-milking cows in the bails ahead. (See Figs. 9 and 11.)

Relative size and cost are considerations in a comparison between this adaptation of elevated-bail premises and the orthodox New Zealand shed. The use of elevated bails in this manner requires a shed much longer than usual and the height of the back wall is also increased. The elevated bails require 8ft. for each cow, plus 6ft. for the up- and down-ramps. This means that a shed to


9


10

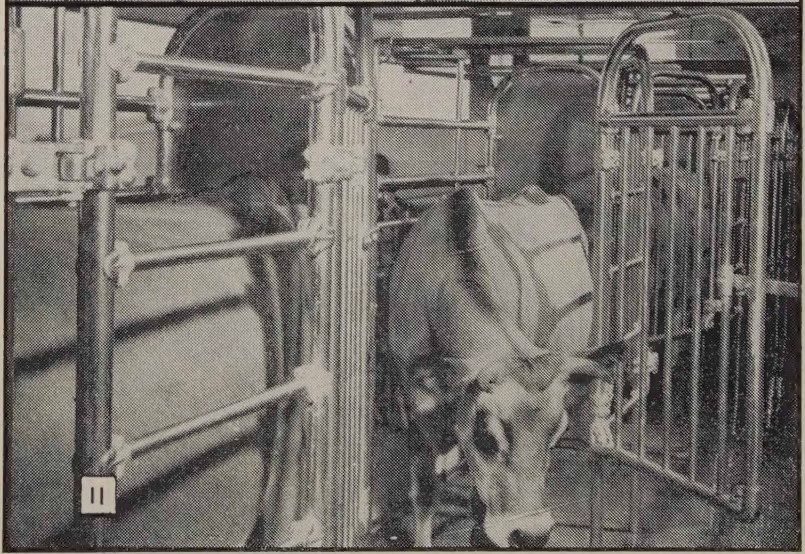
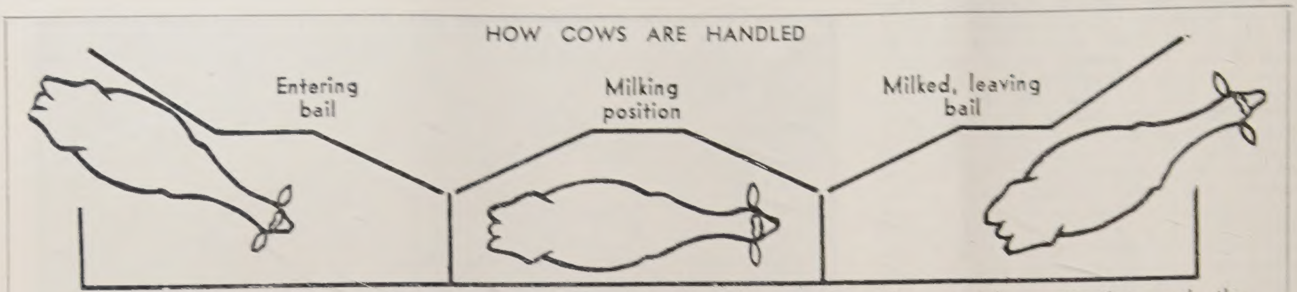
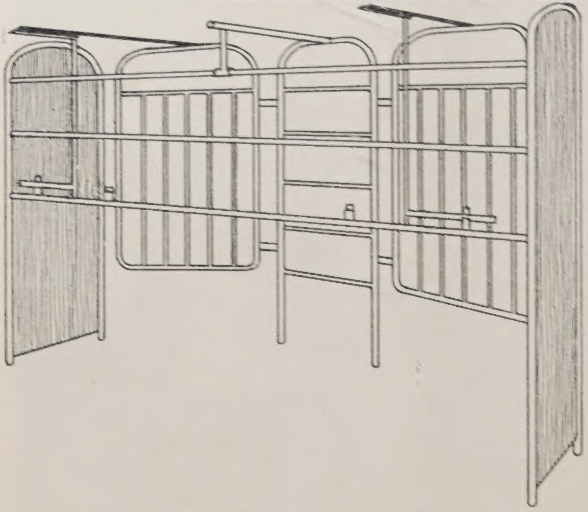

11

Fig. 9—The raised platform, showing the back of the elevated bails and return exit race. Note the drainage fall from front to back. Fig. 10—The operator working in an upright position in front of the raised platform. The automatic milk-weighing devices are shown. Fig. 11—Cow leaving a tandem bail after milking. On the left is a cow being milked in the bail ahead, illustrating the advantage of tandem bails over race bails.

HOW COWS ARE HANDLED



These diagrams show the special construction and the advantages of the tandem-bail system.



accommodate 6 cows has a little more than twice the length required for dummy bails in the standard type. The question of cost in relation to convenience will be one for the individual farmer to decide, but this two-way adaptation of American bails to New Zealand standard sheds and vice versa provides the most sanitary and convenient method of stoopless milking, and the speed of milking is likely to be increased. Undoubtedly for operators working in a standing position much of the drudgery attached to milking will be removed and those who consider the expenditure worth while will examine the example given. (See Fig. 12.)

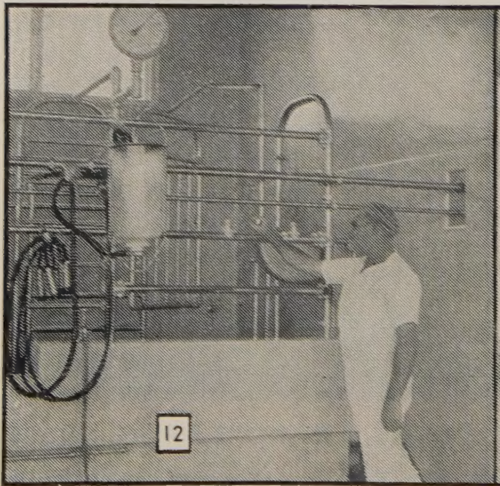
The new premises have been in use for some 4 months and have given every satisfaction. There has been no difficulty with the cows reaching or leaving the raised platform and they quickly become accustomed to the new type of bails and return races. There has been insufficient time to estimate accurately the American claim that this form of milking is speedier than other methods, but this is likely to be substantiated. The milking rate in March was 6 minutes per cow, but this is likely to be increased as the cows and operators become more accustomed to the routine. This present rate of 10 cows per set of cups per hour and 30 cows per person per hour is better than the New Zealand average, and a milking rate of 15 cows per set and 40 per unit of labour per hour is likely to be reached.

Examination of the bails during milking shows that the handling and milking of cows will be faster under this adapted elevated-bail system than with the standard New Zealand method. Faster handling of cows is possible owing to their quicker entry and discharge and to the fact that no bailing is required. Speed in handling is also assisted by the elimination of breeching chains and leg roping. These important features, combined with the ease of operation on the part of the milkers, are the essential considerations. Observation of the two methods reveals impressively the speed and convenience of handling cows with the elevated-bail system and the extent by which the labour of milking has been reduced.

It is likely that this dairy is the only one of its kind in the world. Although the elevated-bail system of milking was introduced in America, it has not hitherto been adapted in this form in that or any other country. The result of this planning has been that the type of shed most suited to New Zealand's climate and conditions has been retained, and at the same time what is known as stoopless milking in a satisfactory form has been achieved.

Because of the interruption of work by continuous visits of small parties, visitors should be organised into larger groups and appointments made with the owner to inspect the premises.

All photographs by Sparrow Industrial Pictures Ltd.


12

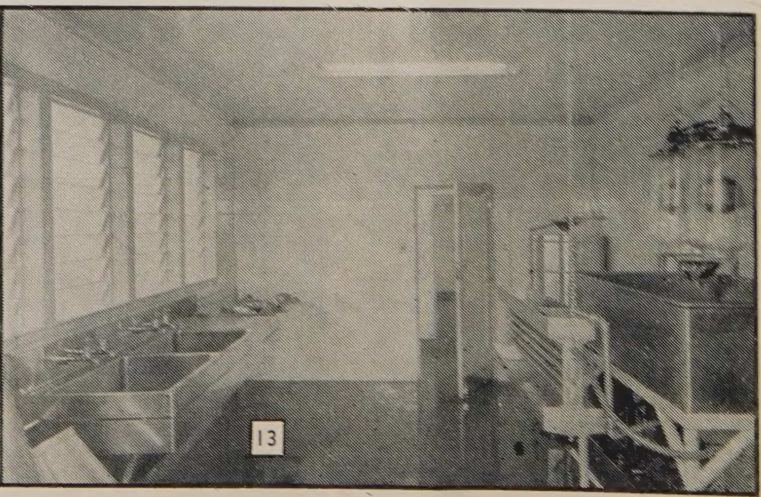

13

Fig. 12—Exit gate on a tandem bail being opened. Fig. 13—Interior of the modern releaser room, showing the tiled surfaces and stainless steel equipment.

An Easily Handled Field Loader for Bulk Lime

By C. J. CROSBY, Machinery Instructor, Department of Agriculture, Christchurch

PRODUCTION, transport, and storage of the form of lime in bulk have been extensively developed in recent years and economies of production and handling have been worked out. Problems of production and transport have largely been overcome by commercial enterprise, but the end use of bulk lime on the farm still offers some difficulties to the farmer and the contractor. Probably the greatest of these is the elevation of the lime from the stockpile to the distributor. This has been solved to some extent in the past with front-end loaders and elevators; the latter, though doing the lifting work satisfactorily, have factors that have detracted from their general usefulness. This article describes an elevator or loader that has been developed in North Canterbury in recent months and patented.

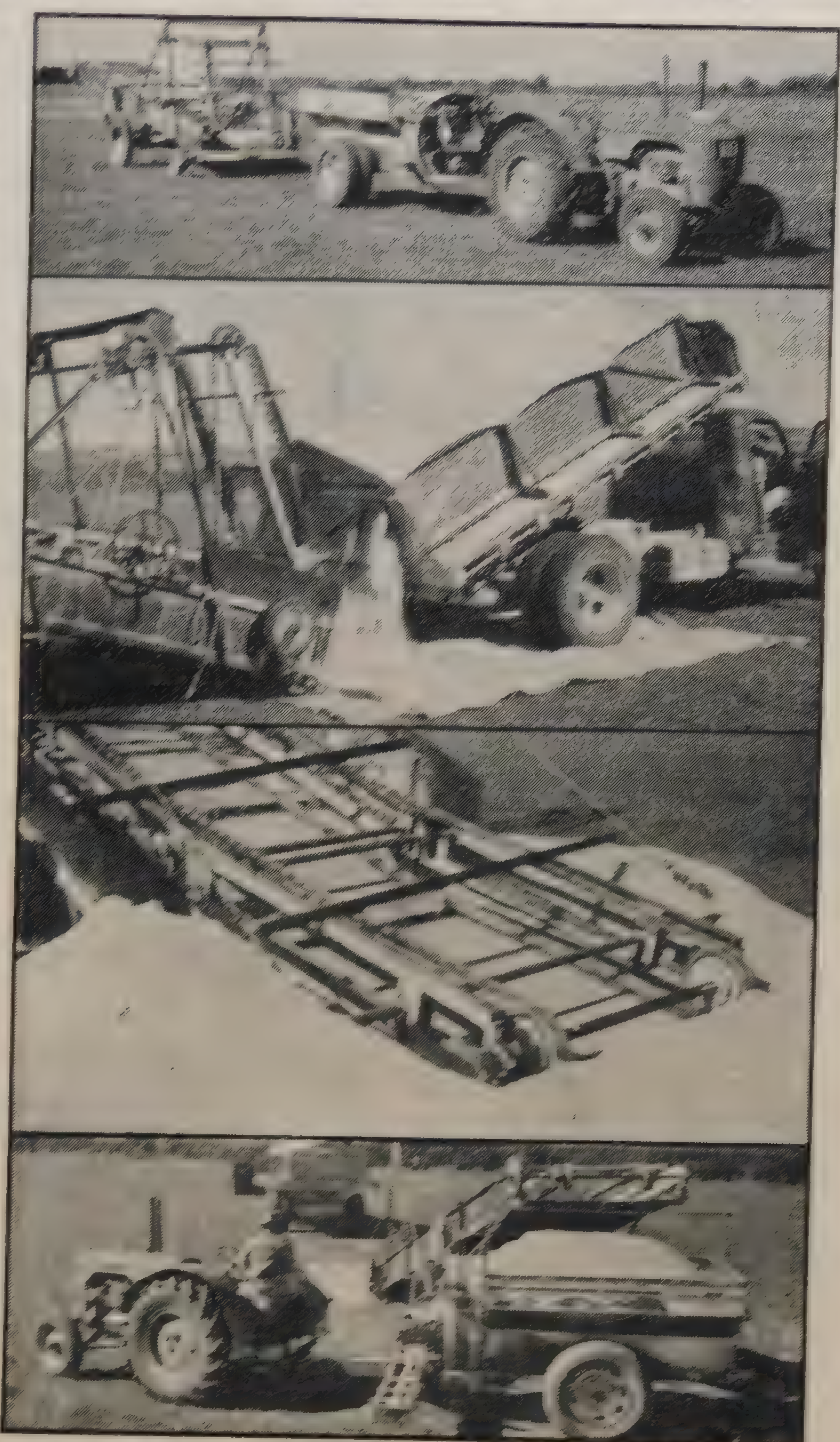
CONSISTING essentially of a wheeled chassis on which is built an inclined plane, the loader has an engine to supply power to an endless-chain scraper mounted on an articulated framework. The scraper framework is partially mounted on its top cross shaft and has its lower portion articulated, the two portions each being controlled by a hand winch for raising and lowering so that it can be adjusted to suit the heap of lime being worked.

Method of Operation

The loader is drawn into the field on its own four wheels and when it is in position the castor wheels are raised to lower the mouth of the scraper to the ground. If the loader has arrived first, a sack sheet is spread in front of it to receive the lime from the transport truck and in this way loss is reduced to a minimum. So gentle is the action of the loader that the sheet shown in the accompanying illustrations has already been used for 2½ months' work without signs of wear.

If the lime is in a bulk heap, the loader's quickly detachable drawbar is fitted to the rear of the loader, which is pushed into the heap by a tractor. With the engine going and the clutch engaged the scraper is lowered into the heap and the lime is conveyed to the distributor, which has been drawn under the upper lip of the loader. Being the width of a standard truck, the loader takes almost the whole width of the lime heap, and its attendant in a few minutes with a shovel can gather in what is missed. When it has loaded the lime within its reach the loader is again pushed into the heap with the tractor, and quick couplings on the front of the tractor and on the loader drawbar make this only a minute's work. If the loader arrives first in the field, the subsequent truck loads of lime are tipped on to the sheet and are used while the truck is returning empty for more lime. On long hauls from the limeworks two or more trucks are used on the road.

The trucks, which are equipped with a special hopper that can be fitted in

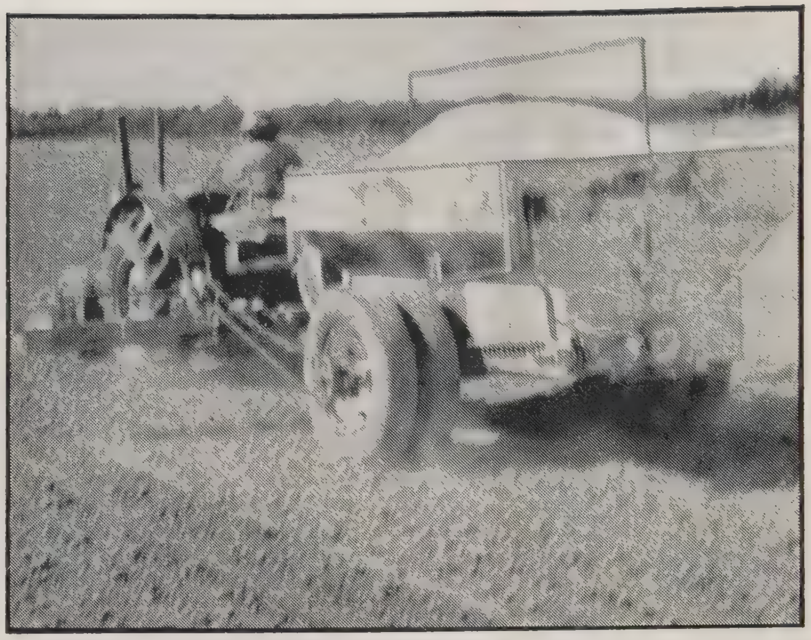


Top—The bulk distributor and bulk lime loader after being drawn on to a field by tractor. Upper middle—By raising the castor wheels the mouth of the loader is lowered on to the sheet on which the truck tips the bulk lime. The truck, a standard tip truck, has been fitted with a bulk lime hopper. Lower middle—The chain scraper mechanism by which the lime is drawn into and up the loader. The articulated scraper can be lowered on to the lime periodically by two hand winches. Bottom—The 3-ton load of lime in the distributor was loaded in 3 minutes and required no spreading as is necessary with other narrower types of loaders.

a few minutes to any cartage contractor's tip trucks, each carry 5 tons of lime.

The loader elevates the lime from the heap to the distributor at the rate of 1 ton per minute. The distributor shown is fully and evenly loaded in 3 minutes without the driver's resorting to shovel work to spread the lime being loaded. Whereas the lime-spreading contractor using the loader handled in a good average week 120 to 130 tons of lime when he received it in bags, he now spreads 170 to 180 tons in the same time with little physical work on his part or on the part of his helper who tends the loader. In a good 10-hour day he has spread 53 tons of bulk lime by the method shown in the illustrations. In 2½ months this contractor and his helper have already spread 1600 tons of bulk lime this year, all with the help of the loader illustrated.

Loaders with hoppers need a ramp for standard tip trucks to load into them, or the tip trays must be specially shortened to allow the truck to tip into them from the ground, but this loader will take lime from any tip truck and in addition will work from a stockpile. The speed of work and ease of handling of this machine should appeal to all engaged in spreading bulk lime.



The distributor quickly spreads the lime at the rate of 1 ton per acre.

Excessive Wool Branding

By G. D SHAND, Livestock Instructor, Department of Agriculture, Timaru

EXCESSIVE wool branding has caused great concern among wool buyers during the past season's sales. Unnecessarily large brands and duplication of brands can be seen on sheep at any sale, and growers must realise that by needlessly "plastering" sheep with branding fluid they are causing considerable damage, which inevitably is reflected in lower prices for their product.

THE question of whether wool branding can be eliminated is a debatable one, but some angles of the problem are worth consideration.

In the author's branding district a total of 1200 sheep owners have registered livestock brands and in many other branding districts (where there is closer subdivision) the total is considerably higher. The small area of a sheep's ear necessarily limits the range and type of placement of marks.

In wool-branding districts use of a brand in addition to an earmark is compulsory; even in districts exempt from branding requirements a desire among owners to have the additional safeguard of branding is evident. Sheep owners can do much to minimise the type of damage which is exercising wool manufacturers and wool buyers; they can eliminate "plastering" the fleece or they may remove the brand when skirting.

Legal Requirement

The relevant section of the Stock Act stipulates a brand of not less than 3in. in length, but not a maximum length.

It is recommended that sheep owners measure up their present registered brand to see if it is excessively large and therefore excessive brand coverage is occurring. There appears to be no necessity to have a brand exceeding 4in. in length. It is common for them to be 6, 7, and 8in. long, and in isolated cases 10in.

The "length" of a brand means the longest measurement any way, which often will be the diagonal distance.

Limiting the measurement to 3 or 4in. will give a neat, compact brand that will not cause excessive deposition of branding fluid.

Placement of the Brand

There appears to be no objection from the point of view of observation to placing the brand in the vicinity of the tail setting just sufficiently high to prevent the removal of the lower portion of the brand during crutching. The most common sites for brands are the withers, top of the shoulder, or centre of the back. These sites are unfortunate choices as on them the most valuable part of the fleece is grown.

The advantage of placing the brand at the tail setting is that the wool carrying a compact 3 or 4in. brand can be removed easily when the fleece is skirted on the wool table. This, however, cannot be done when tup marking is practised. However, to remove the brand when it is on the withers or centre of the back would result in severe mutilation of the fleece. There should be a bag handy to the wool table for branded wool only. The advantages of modifying a brand which is too large have been stressed, but the change can be made only by cancelling the existing brand and by applying to the local Registrar of Brands, Department of Agriculture, for registration of the new brand. It is necessary to submit a tracing of the brand.

Keeping wool-branding irons clean will assist the making of neater brands. Irons are often left hanging up in woolsheds with a thick coating of old branding fluid adhering. A simple way to clean them is to put them in a range or open fire for 5 minutes; the fire will burn off the old material and the irons will then give a clear impression.

Blobs or smears of branding fluid on wool are often the outcome of having too much branding fluid in the pot used for the purpose. A suitable method is to use a strong saucepan with a firm handle in the bottom of which is a piece of shorn sheepskin the size of the inside of the pot. Only sufficient branding fluid to dampen the wool is added.

The "self-inking" type of pad with a reservoir for the branding fluid gives a very clear impression without drops contaminating the surrounding wool.

Purchase of Sheep

Further unnecessary wool marking is that done by a new owner who has bought sheep at a sale or privately. Unless there is possibility of confusion because a neighbour has bought part of the same draft, there is no need to rebrand, as proof of ownership can be established simply in the case of theft or for any other reason by reference to the agents through whom the sheep were purchased.

Hagerdoorn System of Poultry Breeding

OF the many different breeding systems for the up-grading of poultry flocks perhaps none causes more controversy than that advocated by the Dutch geneticist Dr. A. L. Hagerdoorn. In this article J. H. Jones, Poultry Instructor, Department of Agriculture, Christchurch, outlines the system and comments on its advantages and disadvantages to the breeder.

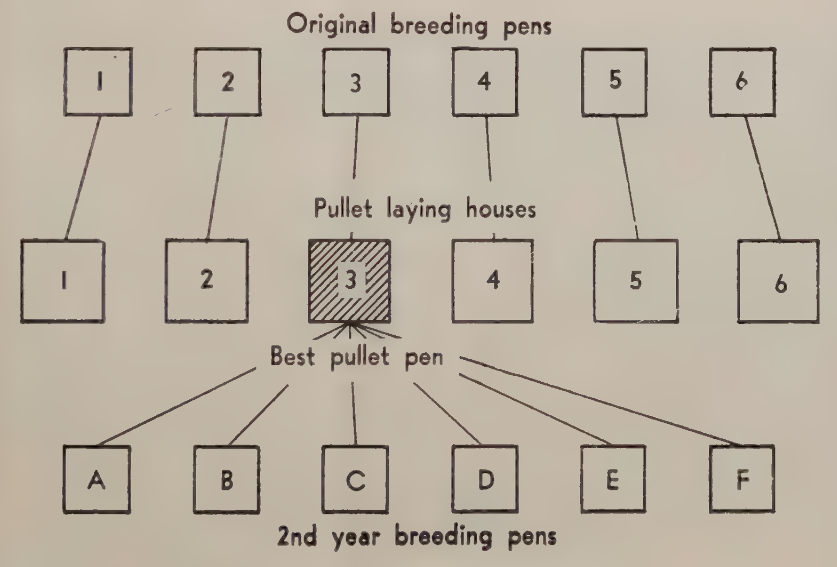
A pen of mass-mated Rhode Island Reds. This is a satisfactory method of raising pullets, but is useless for the system suggested by Dr. Hagerdoorn, in which only one male can be used in a mating.

SUCCESS in poultry breeding does not come through wishful thinking. To build up and maintain a successful strain there must be some definite plan which takes into consideration the laws of nature and makes use of what scientists have discovered in the field of genetics. A haphazard system of selection of birds that handle well and of hoping for the best will lead to stagnation; further improvement will cease and flocks will remain on that level of mediocrity until a definite system of up-grading is launched.

These are the sentiments of Dr. Hagerdoorn, who proposes a system of breeding which he considers suitable for the practical poultry breeder who has neither the time nor the inclination for progeny testing with trap-nests. The system is a variation of that known as line breeding, in which the mating is not as close as with in-breeding but the principles are similar. The mating is restricted to one line of descent to discourage variability and to try to fix desirable characters within a strain by the repeated introduction of the characteristics of an exceptional individual or individuals, and by prevention of the introduction of other factors which are likely to prove dominant to them. Line breeding is less risky than in-breeding; beneficial or harmful effects are less marked. Very closely in-bred stock tends to lose vigour and precocity and may become undersized and lacking in vitality. The impurity which individual selection will leave in a breed is the cause of these troubles, which become very apparent on in-breeding, the inferior quality of the in-breds being directly due to the impurities in the genetical make-up of the parents. The only way out of this difficulty is group selection or progeny testing.

Progeny Testing of Male Bird

In a good flock of birds some are homozygous (pure bred) and others heterozygous (impure bred) for the desirable qualities which they display. The only way to discover whether a bird has the ability to pass on her good qualities to her progeny is to observe the performance of that progeny. In poultry breeding this is difficult, as each hen has only a small number of offspring and these are generally from one father. Further, it is necessary in testing the performance of a female's progeny to trap-nest her and record each chick to her, and this entails a great deal of work both in the trapping and the recording. A very much simpler method, Dr. Hagerdoorn contends, is to progeny test the male.

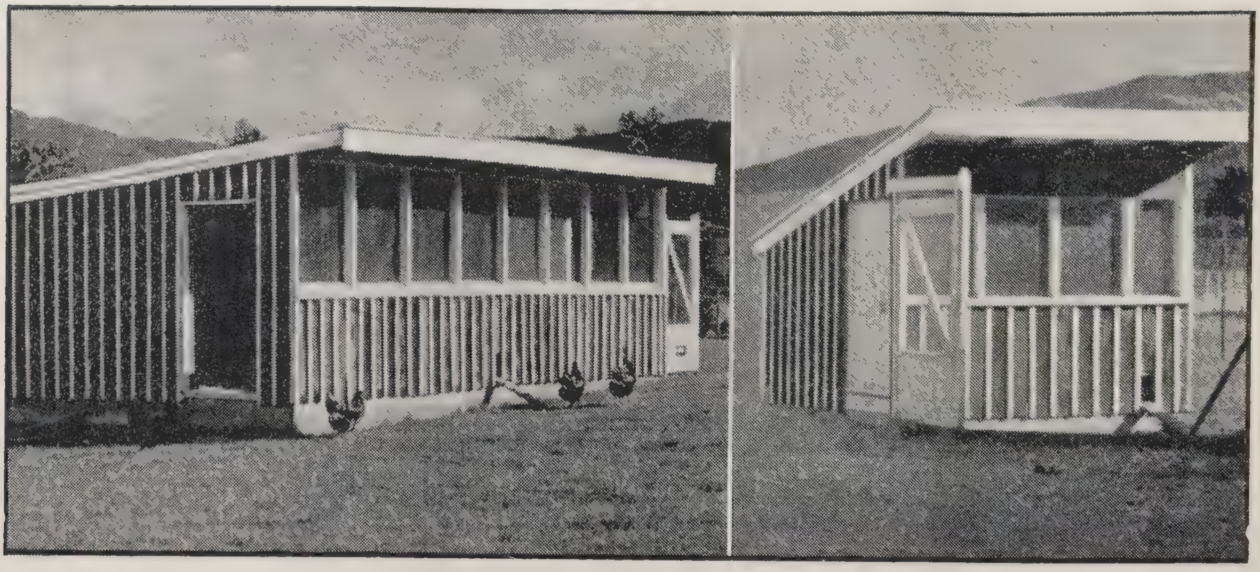


Plan of Hagerdoorn breeding system.

Dr. Hagerdoorn's system consists of using as many males in the breeding pens as there are laying houses for pullets. The chickens are toe marked or punched to each breeding pen and are housed in such a way that in each pullet house there are only daughters of the same father; some of the cockerel chicks are kept in reserve from each breeding pen. It is then easy to keep a record of the performance of each batch of chicks. The chief factors to record are chick mortality and the number of culls removed. When the pullets begin laying there should be noted the number of unthrifty pullets culled, the number and weight of eggs produced, the quality of shells, the persistency of laying (that is, which birds lay longest during the summer before they moult), and the value of the food consumed by the house. The group which is selected at the end of the pullet laying season for breeding stock is that which shows, with its parent stock, the highest number of good points.

Important Initial Points

When the selection is being made vigour and efficient reproductive ability must be considered as of more importance at the outset than high egg-producing qualities, and the mistake should not be made of preferring birds which have a high egg record to those which have produced the highest number of healthy chicks and whose mortality has been lowest. This is a point where the use of the trap-nest is apt to lead one astray, as it is hard to resist the temptation to include in a breeding pen a bird which has a wonderful record, even if she handles indifferently.



Left—A laying shed suitable for housing pullets from a single male bird mating while they are being tested for livability and production. Right—A house suitable for a single bird mating when a male bird is being tested.

The group which is chosen is promoted to the breeding pens and mated with their own half-brothers (which will be full-brothers to a small minority). This system is continuously repeated in subsequent years, so that in every nucleus there is a comparison of a few houses full of pullets.

A combination of group selection and in-breeding has been used in the development of the present strains of agricultural seeds, and a similar system could apply with poultry. Any scheme of purifying and improving a breed entails some in-breeding. Combined with a system of selection for individual high production such a scheme would be very unsafe. The nucleus system should take care of this risk, for any group showing any deterioration due to the fixing of any fault by in-breeding is automatically rejected. A male that has some inherent weakness will have no chance of being kept on.

Dr. Hagerdoorn emphasises that a poultry breeder wanting to improve his stock will have to cease the popular method of trap-nesting. A much safer way is to compare large groups of pullets, each group consisting entirely of the daughters of one sire.

Adaptability of Scheme

The scheme may be adapted to whatever equipment the breeder has available. He may use six small pens and six large laying houses in which to house the progeny, or he may, of necessity, split up the pullets into smaller groups to fit into the available accommodation. For the selection of the breeding pens with which to begin, Dr. Hagerdoorn suggests that the distribution should be as even as possible. Naturally no poor birds should be included, but care should be taken not to have all the best in one pen. Arrangements should be made for as many chicks as possible to be hatched at the same time, and they should be marked at hatching for identification to their sire. The chicks should be raised in mixed lots as far as possible, and a record made for each male sire who has headed the breeding pen. If mortality is too high in any one lot, the birds should be sold. The pullets should be culled in autumn and a note made of the number discarded from each sire. They should then be housed in their six groups in laying houses. Ultimately at least six half-brothers of the best pen will be needed, and it is best to reserve at least 10 cockerels from each group.

When, after a few months, the records begin to show a difference, some of the cockerels which will obviously not be needed may be sold. The final selection having been made, the pullets of the best laying house are split up to use in the breeding pens in their second year. If the father is still alive, he might be used to head one of the pens. Dr. Hagerdoorn admits that the system involves keeping a large number of young males through the winter, and says that if anyone is very much afraid of in-breeding, there is no great harm in using the sons of a very good pen on the daughters of the very best pen, but he does not advocate this. He says that a breeder may wish after a year or two to start two separate lines, which he can cross together and the progeny of which he can sell.

Australian Seed Potatoes

SEED potatoes are in short supply this year and potato growers may be tempted to use for seed some of the potatoes imported from Australia for table purposes.

This practice cannot be encouraged, as there is a slight risk of introducing some disease not present in New Zealand. That risk does not occur with the potatoes imported specifically for seed purposes, as extra caution has been taken in selecting the supplies.

Different Opinions of Breeders

It is probable that Dr. Hagerdoorn's system could be used with profit by poultry breeders in this country as a sound basis on which to work their selection, but successful breeders advocate occasional out-breeding, and it is as well to remember this fact. In bringing in fresh blood to a closed flock it is advisable to use birds which have been bred successfully with one's own stock on a customer's farm.

Also there is surely no reason why the birds of the tested breeding pens, having proved successful as yearlings, should not be bred from for a second season (in their third year), and it might be wise to retain the best parent pen each year as an insurance policy.

Dr. Hagerdoorn does not take into consideration body type or conformation to breed standards, and definitely states that in his opinion these factors should not be taken into account, as they are liable to complicate the issue unnecessarily. On these points much controversy arises with the established breeders, in whose opinion body type and conformation to breed have a definite bearing on the quality of the bird, and it would be wise not to ignore their opinion, founded on long experience. Dr. Hagerdoorn's attitude may be explained by the fact that much of his experience in practice has been with ducks rather than with hens. Another important matter affecting egg production is broodiness, which may become a serious handicap in heavy breeds.

There are thus a large number of factors to be dealt with when a selection of the best pen is being made, and it might be difficult to make a decision. It might then be advisable to run two strains. Poultry breeding never has been easy, and will always be an art as much as a science.

Management of Glasshouses

By R. R. WHITE, Horticultural Instructor, Department of Agriculture, Dunedin

THE management of glasshouses consists mainly of giving the plants a healthy environment. The correct amounts of light, fresh air, moisture, and heat should therefore be ensured and attention paid to the important aspects of glasshouse hygiene and disease control. Correct methods of seed sowing, pricking off, planting, and potting should also be strictly adhered to.

[Jack Welsh and Sons photo.

Routine sprayings are necessary to control insect pests and diseases.

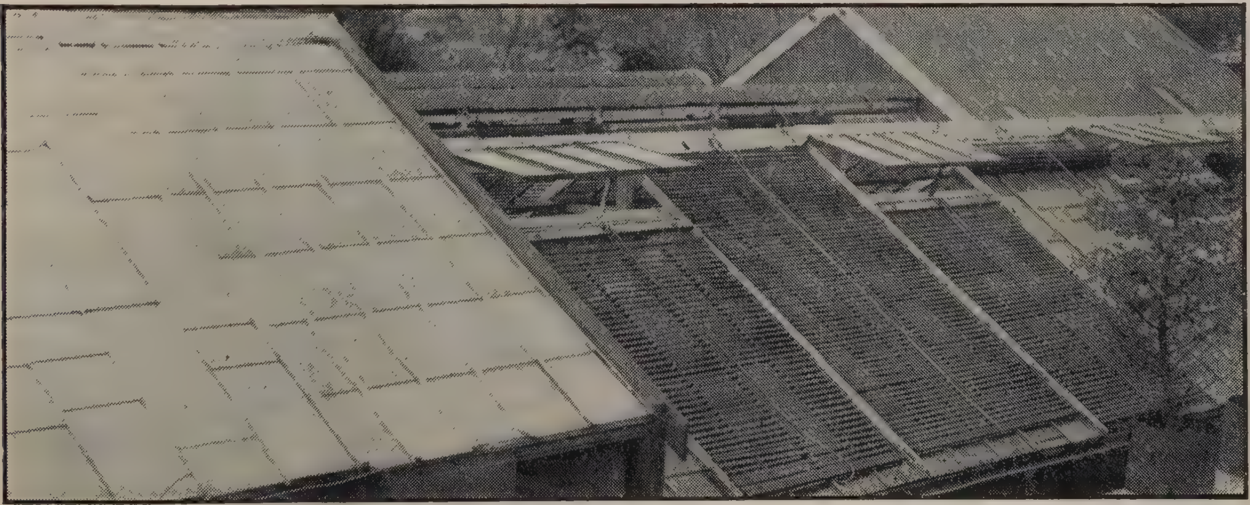
LIGHT plays an important part in plant life, enabling the process of photosynthesis to be carried out. However, too much light in the form of bright sunshine may prove harmful, especially to small seedlings and shade-loving plants. Some plants, however, require all the light available, although the heat effect may cause damage. Shading of the house helps to reduce light intensity and this can be achieved in two ways.

Methods of Shading

The first method is to apply a coat of whitewash or whiting to the outside glass surface. Such a mixture can be prepared by mixing whiting with cold water to form a thin paste to which is then added liquid glue as an adhesive. Though cheap, this method has the disadvantage of cutting the light down too much on dull days, and in districts where such days may be numerous plants tend to become drawn. More than one application may be necessary during the season, as shading is usually washed off by heavy rain or hail storms.

In winter the shading has to be removed, as plants then require all the light available. This can be done by washing the glass with a solution of caustic soda. At the same time unshaded glass can also be washed to remove any dirt, thus allowing as much light as possible into the house.

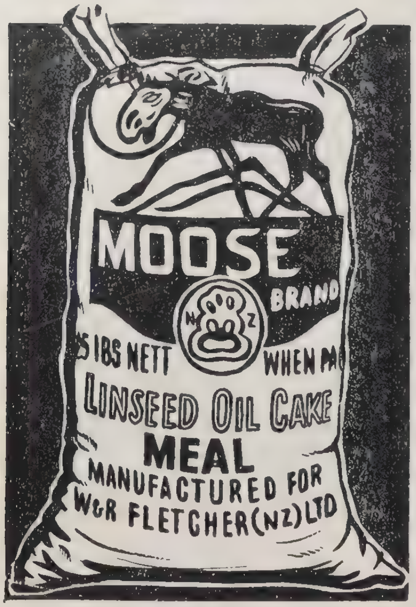
The second method of shading is with the use of blinds which can be raised or lowered as required on the outside of the glass. Though rather expensive for large houses, this method is very useful for smaller types. The blinds can be made from scrim, canvas, or wooden slats. By pulleys and cords these can be rolled up when the sun is not shining. The scrim or canvas can be tacked to a wooden strip, fixed to the gable of the house, and a wooden roller at the bottom. One end of the cord is fixed to the gable and runs down the glass round the roller and back to a pulley which is above the wooden strip and also fixed to the gable. From there the cord is brought back to the bottom of the house or by a small hole in the roof it can be run down inside the house and thus allow the raising and lowering of the blinds from within the house. By pulling the cord the blind may be rolled up. Wooden slats 1in. x 3/16in. spaced 1in. apart and attached to chandelier chains with bifurcated rivets make the best type of blind.



[Jack Welsh and Sons photo.

Seedlings and the more tender plants require shading from bright sunshine. The house on the left has been shaded with a whitewash mixture while the one on the right has wooden slat blinds which can be raised or lowered as required.

Feed



until the Grass comes away

Write for free illustrated catalogue to **Speedway Products Ltd.,** 26 Albert St., Auckland. South Island Distributor: A. H. Turnbull & Co., Ltd., Christchurch.

FOR NORTH ISLAND CUSTOMERS—

Waerenga Wines

Produced by the Te Kauwhata Horticultural Station

Madeira Port Apple

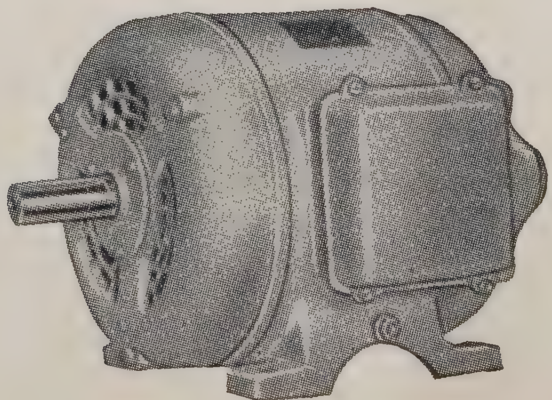
In case lots: 2 gallons in 12 bottles.
Assorted cases with 6 bottles each of two kinds or 4 bottles each of three kinds can be supplied.

PRICE £3/16/- PER CASE,
including rail freight from Te Kauwhata to the nearest officered railway station. Cheques should include exchange.

Orders may be placed at the following offices of the Department of Agriculture:
AUCKLAND, HAMILTON, KAITAIA, KAIKOHE, WHANGAREI, PUKEKOHE, TE KAUWHATA, TAURANGA, TE AWAMUTU, TE KUITI, TAUMARANUI, THAMES, PALMERSTON NORTH, DANNEVIRKE, GISBORNE, HASTINGS, HAWERA, MASTERTON, NEW PLYMOUTH, STRATFORD, WANGANUI, WELLINGTON.

TO-DAY'S MOTOR—

THE BRITISH **CROMPTON PARKINSON**



- Greater Compactness.
- Ample Protection.
- Balanced Ventilation.
- Immense Strength.

Buy from your local dealer or N.Z. representatives.

A. & T. BURT, LTD.

Roller blinds can be of use on frosty nights, as they help to keep the frost off the glass and economise in heat where it is used in the house.

Ventilation

Ventilation is necessary to ensure a good circulation of air round plants, especially where there is a possibility of attack by fungus. During warm weather ventilators can be opened wide all day and partly at night. In houses with ventilators on either side of the gable only those on the lee side should be opened when a wind is blowing to prevent draughts. On hot windy days it is good practice to close ventilators or nearly so, as the air inside the house becomes dry, causing too rapid transpiration in the plant and wilting and possible complete collapse.

Where heat is laid on in winter careful ventilation is necessary to prevent too much heat loss. Ventilators should only be opened on fine days, preferably when the outside air is warming up, and closed not too late in the afternoon to maintain the temperature in the house. For cold houses the same course may be followed, except that closing of the ventilator in the early afternoon helps to trap any heat in the house caused by the sun.

Seedlings ready for pricking off.

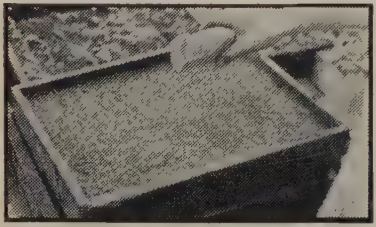
Watering

Water enables plants to take up the necessary nutrients in the soil and so correct watering is essential. Over-watering should be avoided as it drives all the air from between the soil particles, thus depriving the roots of this necessity. Plants become wilted and as often as not more water is added, completely waterlogging the soil with resultant killing of the plants. The results of under-watering are known by all. No hard-and-fast rule can be laid down as to when to water, as this can only be determined by studying the condition of the soil. For well-established pot plants a fairly safe rule is to water them when the soil begins to leave the wall of the pot, filling the space between the soil and the top of the pot completely. With seedlings the topsoil layer should never be allowed to dry out.

Humidity can be maintained in the houses by "damping down" all walks and staging and also by using a fine syringe.

Care of Heating Units

In houses where heating units are used, economy in their use is the key to successful glasshouse cropping. Therefore they should be kept in first-class order. The most important part of any heating system is the boiler. It must be kept clean at all times so that it can produce the maximum heat for the fuel consumed. Many boilers are automatic and have a forced draught. The draught box must be kept clear of any debris and the combustion chamber requires periodic cleaning to remove clinker and ash. With oil burners a periodic check of jets and other equipment is essential. Flues and heating surface require daily cleaning to remove soot and ashes, which can have an appreciable insulating effect.



[*Jack Welsh and Sons photo.*

The soil in the tray should be firm with the surface level and about ½in. below the top of the tray. Seed may be sown directly from the packet or shaken from a piece of paper to give an even distribution.

Where a thermostatic control is used this should be checked with a thermometer to see if it is operating at the correct temperature. As the thermostat often cuts off the heater during warmer winter days, a good practice is to switch the thermostat out in order to have the water in the pipes hot when temperatures begin to fall during late afternoon. Pipes that are used solely for heating the air need to be kept clear of soil and debris to give as large a heating surface as possible to the air. They also require a periodic check to guard against air locks and possible leaks which may mean the loss of valuable hot water.

Maintenance is essential for all houses and is best carried out when they are free of plants, in most cases during the winter. Any cracked or broken glass may mean drips and cold draughts, while a thorough cleaning of the panes gives more light. Where blinds are used for shading they may be taken down, oiled in the case of wooden slat types, or repaired where necessary. A coat of paint on all woodwork at least every 2 years adds to its life.

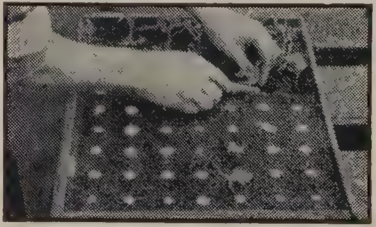
Pest and Disease Control

To grow healthy plants greatest attention must be paid to all aspects of insect pest and disease control. Hygiene is the first essential. At no time should rubbish be allowed to accumulate under a bench just because it cannot be seen. Such an accumulation is usually the first place from which diseases come, especially if it includes dead plants. Spraying and fumigation should be worked to a strict routine, thereby preventing disease rather than having to control it when it is rampant among the plants.

Spraying should not be carried out when weather conditions are cold and damp. The ideal time is when the spray will dry quickly on the leaves. Spray equipment should be thoroughly cleansed after use. Hot soapy water followed by two or three rinsings with clean cold water ensures the removal of residues in the sprayer.

Fumigation is a good method of killing any insect pests within the house. The advantage of this type of control is that it can be done last thing in the afternoon so that the house can remain shut during the night, allowing the fumigant to have full effect.

For good fumigation all possible care must be taken to prevent leakage of the fumigants. Draughts should be eliminated. A respirator should always be used. It is good policy to have



[*Jack Welsh and Sons photo.*

Pricking off tomato seedlings. Note the use of a dibble for making the hole and for firming the seedlings. The box has been marked out by dropping oyster-shell lime through holes in a perforated sheet of tin.

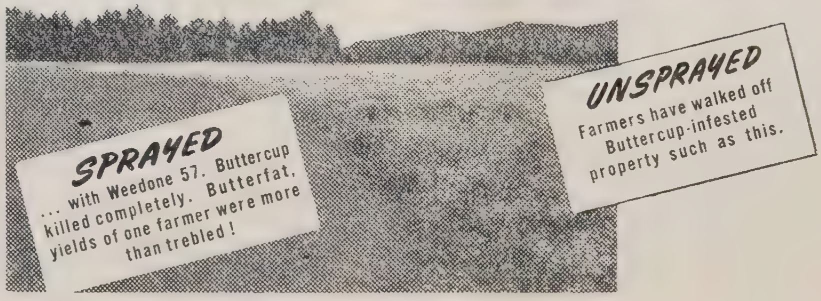
Does your Farm produce

BUTTERCUP OR BUTTERFAT

GRATEFUL FARMER REPORTS SPECTACULAR RESULTS

"Three years ago I was desperate and was faced with the alternative of ploughing my whole farm or walking off the property. I sprayed a ten acre paddock with Weedone 57 with astounding results. I have now sprayed my whole farm twice. My butterfat yield has been more than trebled."

This testimonial shows how WEEDONE 57 can change useless, Buttercup-infested areas into **profitable pastures.** Spreading rapidly, Buttercup quickly destroys the vital earning power of your pastures! And, after all, you depend on your pastures for your livelihood. The photograph at right shows how WEEDONE 57 ended the Buttercup curse . . . making room for healthy, vigorously growing grasses. Spraying WEEDONE 57 can do the same on your farm . . . bringing you more butterfat, more profits from every acre. **You can't afford to waste a day!**



SPRAYED
. . . with Weedone 57. Buttercup killed completely. Butterfat, yields of one farmer were more than trebled!

UNSPRAYED
Farmers have walked off Buttercup-infested property such as this.

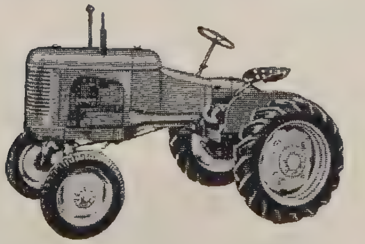
KILL BUTTERCUP WITH

WEEDONE 57

WEEDONE 57 is another tried and proven product of Ivon Watkins Limited. For further details write to your nearest Weedone Service Distributor or Co-Distributor for free report on your Buttercup problem. I.W.44

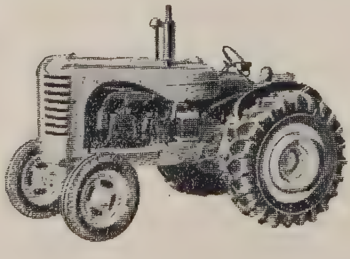
Powered to fit your farm

MASSEY-HARRIS
1 PLOUGH "PONY"



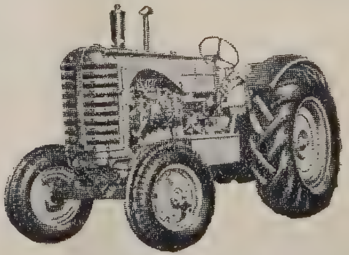
Rugged, dependable power for all small farm jobs. Three forward speeds: 2¾, 3½ and 7 m.p.h. 12 16 B.H.P. Ideal for market gardeners and row-crop farmers, with smooth, effortless power that is lively, responsive, flexible to meet varying conditions.

MASSEY-HARRIS
3-4 Plough "744D" Diesel



With Velvet Ride Seat . . . firm traction and lugging ability, 5-speed transmission, clear full-vision, shock-resistant steering, 46 B.H.P. A tractor packed with ready and willing power for heavy work.

MASSEY-HARRIS
4-5 PLOUGH "55D" DIESEL



Just about the biggest tractor there is on 4 wheels. For sheer brute strength the "55D" cannot be beaten. Exclusive Dyna-Cell combustion gives powerful, smooth operation. For your big field or belt jobs, do them better, faster, cheaper with the "55D". 66.91 B.H.P.

MASSEY-HARRIS CO LTD

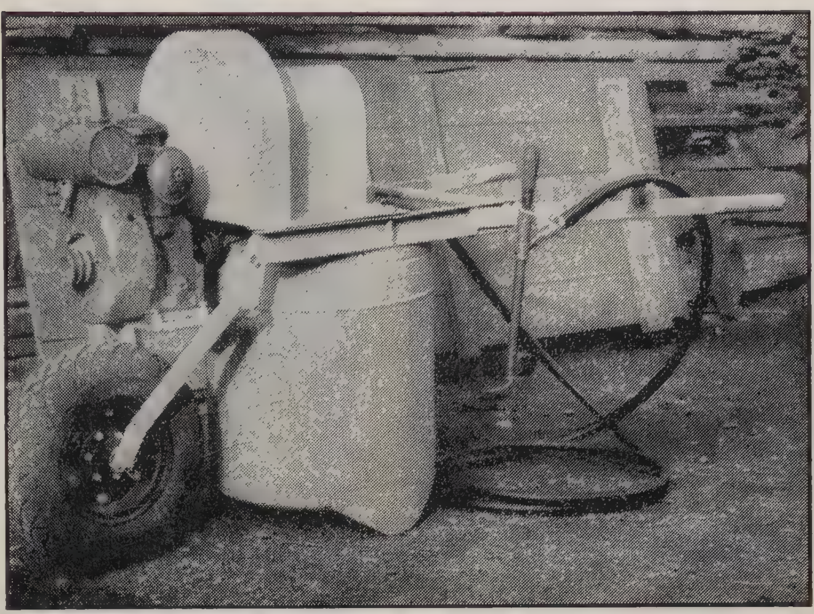
Head Office: Christchurch. Branches: Auckland, Palmerston North, Dunedin. Agencies everywhere.
(P. & D. Duncan Implements are sold exclusively by Massey-Harris Co. Ltd.)

another person standing by in case the operator is overcome by the fumes. The types of fumigants available are smoke producers, vaporising liquids, and gas-producing powders activated with water or acid. The last type includes the cyanides which produce the extremely poisonous hydrocyanic acid gas. They are dangerous and should not be used in glasshouses in heavily populated areas or by persons inexperienced in their use. Hydrocyanic acid gas may cause damage to plants.

Use of Compost

When plants are raised from seed a good compost is the first requirement. The best used are the John Innes composts and for seed sowing the one to use consists of sterilised loam 2 parts, sharp sand 1 part, peat or leaf mould 1 part (all by bulk) to which are added 1½oz. of superphosphate or reverted superphosphate and ¾oz. of carbonate of lime per bushel of mixture. Care must be taken when filling the seed box to have the soil firm but not packed too hard, with the soil surface level and about ½in. below the top of the box. The soil should then be watered thoroughly and the box left to drain. The seed can then be sown. To do this put the seed on a piece of cardboard or paper, hold it firmly in the hand, and tap it gently with the forefinger so that the seed falls off the paper slowly. At the same time the hand should be moved to and fro across the box to give an even distribution of seed. Practice can be gained by using sand instead of seed. The amount of soil covering the seed depends on the fineness of the seed. Very fine seed needs very little soil coverage, though coarser seed may need about ¼in. As seeds germinate fairly rapidly in a glasshouse, a thick soil coverage is not necessary. This soil can be sieved on to the seed layer, a fine sieve being used, and then firmed gently with a wooden tamper. The box can then be covered with glass and brown paper or just brown paper; at the first sign of germination this can be removed to prevent the seedlings from becoming drawn.

The next stage is pricking off into boxes. The John Innes potting compost is again the best to use for filling the boxes. It consists of 7 parts of sterilised loam, 3 parts of peat or leaf mould, and 2 parts of sharp sand (all by bulk) to which are added 1½oz. of dried blood, 1½oz. of superphosphate or reverted superphosphate, ¾oz. of sulphate of potash, and ¾oz. of carbonate of lime per bushel of mixture. As with the seed box the soil should be firm but not packed hard and the box filled to within ½in. of the top. A suitable marker can be used to mark out the tray for plant spacing. The young seedlings are then lifted from the seed tray and inserted in the holes made by using a dibble. The soil is then firmed around the seedlings. Seedlings should be pricked off before they become too large, so that the rooting system is still small enough to sustain little damage. When the box is filled with the required number of seedlings it can be placed in the house and watered thoroughly with a fine rose watering can, care being taken not to wash out any of the small seedlings.



[*Jack Welsh and Sons photo.*

A power sprayer can be used in larger glasshouse units. Thorough cleansing of the equipment is essential after use.

[*Jack Welsh and Sons photo.*

Rubbish under the bench is a good breeding ground for pests and diseases.

Before planting out in the glasshouse crops such as tomatoes the soil should be worked to a fine tilth and fertilisers added. The plants need to be firmed so that they cannot be lifted out and then watered if required.

For potting the compost used is the same as for pricking off. Good fibrous loam is an advantage. The first essential is to use pots that are clean and properly crocked. A large crock is placed over the drainage hole in the pot bottom and covered with smaller crocks. These can be obtained from broken pots, or clean well-weathered coke and coke breeze can be used. Fibre can be placed on top of the crocks to prevent soil particles from falling down.

Potting is best carried out on a bench. A three-sided bin is used for holding the soil, with the empty pots and plants on one side and the potted-off plants placed on the other. Some soil is placed in the pot, it is firmed with the hand, and the plant is lifted from the box with a flat stick. The plant is then placed in the pot, held upright with the left hand, and the soil run in around it with the right hand. The soil is then firmed and more is added if necessary to bring the soil level to within ½in. of the edge of the pot. The pot is then placed in the house and watered thoroughly.

With pots, spacing is important as it prevents overcrowding and resultant weakness in the plants. For potting on the soil usually requires to be much firmer and a potting stick can be used. Except where root pruning is practised, all rooting systems should be disturbed as little as possible when potting off or potting on.

Survey Shows Decline in Use of Pampas Grass

RESULTS of a survey of 147 plantations of pampas grass growing mainly on dairy farms in various parts of New Zealand were published in the July 1948 issue of the "Journal". At that time pampas grass was being planted widely, particularly by dairy farmers in the warmer parts of the North Island. The survey showed that a large percentage of the farmers whose plantations were included in the survey were satisfied with pampas grass as a fodder plant. Recently an endeavour was made to follow up this survey with another one, the object being to ascertain what changes, if any, there were in acreages and farmers' opinion. Details of 104 plantations, involving 312 acres, were secured.

In the last 4 years pampas grass has fallen considerably in favour among dairy farmers, many of whom consider better production can be obtained from well-managed pastures.

THE following table shows the number of plantations that had been increased in area, reduced in area, abandoned, or maintained at the same area:—

Maintained at former area	61
Area increased	8
Area decreased	11
Abandoned	24
Total	104

The area maintained totalled 197 acres, and 48 acres of plantations were abandoned. The total acreage of plantations where the area was increased rose from 25 to 58 acres, and the total area where it decreased fell from 42 to 20. The net result was a decrease in area of 37 acres or about 12 per cent. of the former total. This decrease would have been considerably greater if areas that were being neglected and allowed to die out had been included in the abandoned areas.

Plantations Allowed to Die out

The figures do, however, show that there has been a total decrease of 70 acres, which has been compensated to some extent by additional plantings amounting to 33 acres.

Although the acreage has been maintained on more than half of the plantations, many of these are being allowed to die out gradually. In a number of cases decreases in area were due to partial failures of plantations caused by damage by stock or poor soil conditions. Abandoned areas included those that farmers wished to eliminate and a number where change of ownership, broken fences, or neglect had so affected the plantation as to make it of little or no value.

In some instances increased areas reflected a desire to have more pampas grass; in others it represented a virtual replacement of portion of a plantation that was not thriving.

Farmers' Opinions

Farmers' opinions on the place of pampas grass in farming still vary considerably. In the following table the opinions of farmers at the time of both surveys is condensed. In both cases it was not possible to obtain definite opinions on all plantations. The figures include only those plantations about which an opinion was expressed.

	First survey Per cent.	Present survey Per cent.
Enthusiastic or satisfied ..	78	43
Dissatisfied ..	22	57

This shows that over the past 4 years pampas grass has fallen considerably in favour. The first survey showed that over three-quarters of the farmers were satisfied and half of them were enthusiastic; in the present survey fewer than half the same farmers were satisfied and only one in 12 was enthusiastic.

The survey shows that, although relatively few farmers rely on pampas grass entirely for winter feed, a considerable number regard it as a useful standby if hay or silage is not available. Most farmers using pampas grass do so in conjunction with hay, silage, or pasture. Most of the farmers who are dissatisfied with pampas grass consider that it does not produce as much valuable feed, on good land particularly, as will good pasture. These comments apply particularly to dairy farms.

The survey covered comparatively few hill-country farms, but there is some evidence that pampas grass is regarded favourably for the wintering of run cattle. Pampas grass is valuable in that it replaces hay, the saving of which on hill-country farms is often difficult. Hill-country improvement, resulting in increased carrying capacity of both sheep and cattle, necessitates the provision of more winter feed, and it is on such improved farms that the area of pampas grass is likely to be increased in the future.

Changed Circumstances

Though the survey shows a marked decline in the popularity of pampas grass as a fodder plant, it should be remembered that the first survey was done when pampas grass was at the peak at its popularity and when, owing to shortage of fertilisers during and after the war, pastures were not as good as they are now. Pampas grass provided much-needed supplementary feed which was not available as hay and silage. Since the first survey the need for pampas grass has lessened considerably, mainly because more "grass" feed (autumn-saved grass, hay, and particularly silage) has been available.

Pampas grass is likely to be of value on dairy farms only when it is not possible to grow sufficient pasture for the provision of winter feed. Pasture production depends largely on availability of fertilisers and efficient utilisation of pasture. Insufficient fertiliser or poor utilisation lower production from pasture, and pampas grass then becomes relatively more valuable.

—*S. H. SAXBY,*
Agrostologist,
Department of Agriculture,
Wellington

Sleepy Sickness and Milk Fever in Ewes

SOME of the facts about sleepy sickness of ewes and how knowledge of them can be applied are dealt with in this article, which is based on a paper given at the Ruakura Farmers' Conference week by J. C. Gerring, Animal Research Extension Officer, Department of Agriculture Animal Research Station, Ruakura. A section on milk fever in ewes, a condition which is sometimes confused with sleepy sickness, is also given.

SLEEPY sickness is a disease of sheep which occurs toward the end of pregnancy, usually during the last 3 weeks before lambing. Older ewes in good condition are more readily affected than young sheep or ewes in poor condition.

Despite the enormous amount of detailed research work which has been carried out in many countries, including U.S.A., South Africa, Britain, Australia, and New Zealand, the cause is still unknown; that is, it cannot be explained why the affected animal shows the symptoms typical of the disease, nor is there any effective treatment once these symptoms have developed fully.

Though odd cases occur without any obvious precipitating cause, where a number of cases develop in a flock these are always associated with a fall in the level of feed intake during the last few weeks of pregnancy. Though this reduction in feed intake may be due to a fall in the amount of feed available, it may also be due to conditions which adversely affect the appetite of the sheep; for example, a sudden change to a different kind of feed, a spell of cold weather, or the development of some other disease, such as foot-rot, worms, etc.

Some farmers have associated the feeding of swedes to in-lamb ewes with the occurrence of sleepy sickness. Many farmers feed ewes on swedes without sleepy sickness occurring. Providing the change to swedes is not too sudden and not too close to lambing, and providing plenty of swedes are available, there is no reason why the disease should occur on this crop.

Disease Produced Experimentally

Hopkirk, working at the Department of Agriculture Animal Research Station, Wallaceville, was one of the first to produce the disease experimentally, and this has since been done by many workers in other countries. In each of these experiments reduction in the level of feed intake was the method used. Other methods tried included restricting exercise, feeding a maintenance ration followed by liberal feeding, and feeding rations both low and high in protein. These did not produce the disease.

Symptoms of sleepy sickness were produced in ewes which were within a few weeks of lambing in 3 to 7 days after a severe reduction in feed intake. A group of non-pregnant ewes whose feed intake was similarly reduced also developed symptoms of the disease, but they were much less severe and took 24 to 48 days to develop.

For many years the opinion was held that the disease was due to poisonous waste products produced by the developing foetus which the ewe, owing presumably to some abnormality in her excretory system, was unable to eliminate. For this reason the disease got the name of pregnancy toxaemia. There is no evidence for this theory, and the fact that the disease can be produced in non-pregnant animals would seem to disprove it.

The importance of pregnancy in causing the disease is due to the increased demand it makes on the maternal system, and this is still further increased when two or more lambs are present. Of even greater significance is that this demand increases very rapidly during the last month of pregnancy.

Wallace, while working at the School of Agriculture, Cambridge, England, made some interesting investigations on the development of the young lamb during pregnancy. Fig 1, showing development of twin foetuses, illustrates his findings. At the end of the first month of pregnancy each developing foetus weighs only 1/60oz. One month later it weighs only 2oz. Three months after conception it weighs only between 1 and 2lb. By the end of the fourth month its weight increases to between 4 and 5lb., and at birth, 5 months from conception, the new-born lamb weighs about 10lb. Over 50 per cent. of its weight increase takes place during the last month of pregnancy; that is, at the most critical time for the development of sleepy sickness.

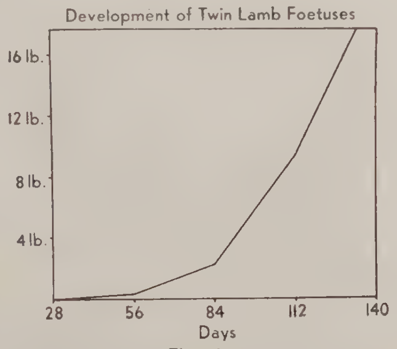


Fig. 1.

Another important aspect of this demand which the developing lamb makes on the ewe is illustrated in Fig. 2.

This is Hammond's theoretical conception of the order of priority in demand which different tissues have on available nutrients. This emphasises how tissues of high metabolic activity, such as the foetal membranes, foetus, and brain, can draw from depleted nutrients at the expense of other maternal tissues of low metabolic rate. In other words, unless the feed intake is very low, the foetus can go on developing at the expense of the mother's own requirements for available nutrients.

Influence of Nutrition

Ewes in good condition are more readily affected with sleepy sickness than poor-conditioned animals, though over-fatness is by no means essential for development of sleepy sickness. This is probably due to the effect of the level of feeding on the development of the lamb during pregnancy.

The design of an experiment in further studies by Wallace supporting this contention is illustrated diagrammatically in Fig. 3. One of the points Wallace was interested in determining was the influence of nutrition on the growth of the developing lamb during pregnancy. He started with two groups of ewes similar in condition which had just been mated to the same ram. For the first month both groups were fed on the same level, so that they were kept at a constant body weight. At this stage one group was fed at a high level to obtain the maximum gain in liveweight and the other group was fed on a low level so that it lost weight. This difference was continued to the end of the third month of pregnancy, when a representative sample of ewes from each group was killed and their lambs weighed. Half of the ewes remaining in the well-fed group were then switched to a low level of feeding and half of those in the poorly fed group were well fed. These treatments were continued until within a few days before the ewes were due to lamb, when each was killed and the lambs weighed.

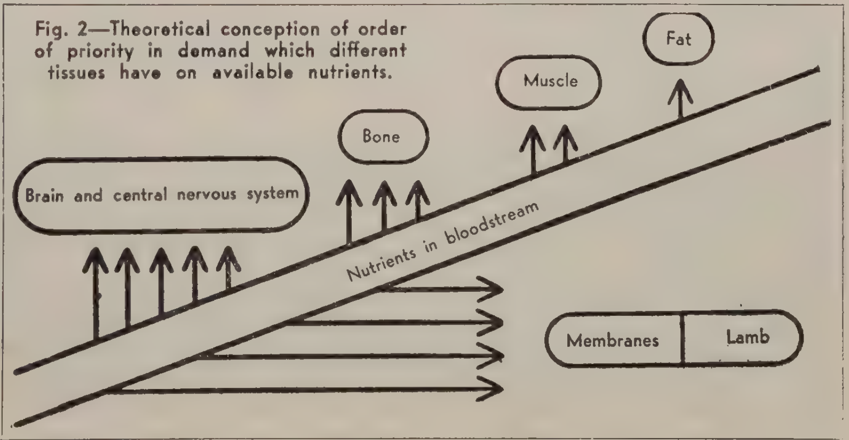
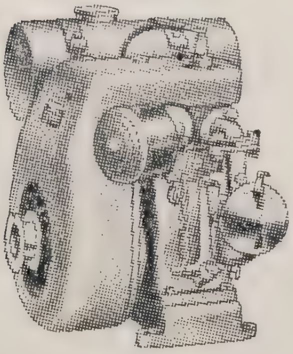


Fig. 2—Theoretical conception of order of priority in demand which different tissues have on available nutrients.

Villiers

LIGHT-WEIGHT ENGINES
For Farm, Workshop, Factory, Contractor, Tradesman or Amateur.



Villiers Will Power:
Generators, Water Pumps, Chain Saws, Vacuum Pumps, Cultivators, Shearing Machines, Rock Drills, Saw Benches, Concrete Mixers, Compressors, Spraying Equipment, Lawnmowers, Inboard Engines.
Obtainable in 1h.p., 2h.p., 2½h.p. Models

N.Z. Factory Representatives:
F. W. CAVE LIMITED,
P.O. Box 1685, Auckland.

NEW ANTI-RUST AGENT!

IN "3-IN-ONE" OIL

NEW discoveries have now made "3-IN-ONE" Oil better than ever! New rust-inhibiting agent, greater penetrating power and balanced viscosity make "3-IN-ONE" Oil the *ideal* lubricant and rust inhibitant around the home, office, workshop and garage. Buy a can *to-day!*

FERGUSON SYSTEM

FERGUSON
The ONLY Tractor with these
5 exclusive advantages!

- Traction without built-in weight.
- Penetration of implement without weight.
- Finger-tip hydraulic depth control.
- Front end kept down.
- Automatic protection of tractor and implement against hidden obstructions.

C. B. Norwood Ltd., Box 1292, Wellington.

★ added constructional advances that mean maximum tyre performance in the worst conditions

DUNLOP
NEW ZEALAND
LIMITED

DUNLOP
FARM TRACTOR TYRES
Ask the man who uses Dunlop!

DTT.1.9

In considering the results Wallace emphasises that they apply only to twin lambs and that the differences in feeding treatments were very severe.

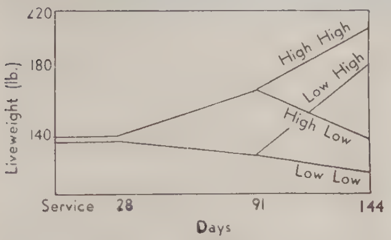


Fig. 3—Effects of different levels of nutrition on weights of in-lamb ewes.

Foetuses obtained from the ewes killed when 3 months in lamb were approximately the same weight, 1.7lb., from both the well fed and poorly fed groups—the level of feeding during the first 3 months of pregnancy had little if any effect on the growth of the developing lamb.

Lambs from these ewes which were well fed throughout pregnancy weighed 11.3lb.; those from the ewes poorly fed throughout pregnancy weighed only 5.8lb. The most interesting feature, however, was that lambs from the ewes well fed early in pregnancy and poorly fed later averaged 6.5lb., and the lambs from the ewes fed poorly at first and then well fed during the last 2 months had an average weight of 11.1lb. and were almost as well developed as the lambs from ewes fed on a high plane throughout pregnancy.

The level of feeding during the last 2 months of pregnancy—the time when most of the increase in weight of the developing lamb takes place—has a marked effect on the size of the lamb at birth.

The fatter sheep carrying twin lambs get toward the end of pregnancy the bigger their lambs are likely to be, and the increased demand on the maternal system made by these heavy lambs renders such ewes more susceptible to sleepy sickness.

The severity of an outbreak of sleepy sickness in a flock will depend on:—

1. The level of feeding during the previous months.

2. The extent to which the level of feed intake is reduced.

3. The suddenness with which the intake is reduced.

4. The length of time sheep are kept at this level.

5. Whether, in individual cases, there is single or multiple pregnancy.

If the reduction in feed intake is sudden, severe, and prolonged, even thin ewes carrying single lambs are liable to develop the disease.

On this basis, and because of the fluctuating nature of available feed in grassland farming, the time to institute preventive measures against sleepy sickness is as early in pregnancy as possible. Wallace has emphasised the importance of flushing ewes, beginning 2 to 3 weeks before the rams are put out and continuing for from 3 to 4 weeks after that. If the ewes' level of feeding is then tightened up, some of the autumn growth can be saved for use during the 5 to 6 weeks before lambing is due to begin. In very adverse seasons when feed is short it is better to delay this lift in the level of feeding until the last 3 weeks of pregnancy than to run short of feed at the critical time. When to begin this rise in feed intake requires careful judgment, based on the condition of the ewes and the availability or likely availability of feed.

Remedial Measures

It is important to be able to recognise sleepy sickness in its early stages, not because affected ewes can be saved by any particular treatment, but so that immediate remedial measures can be taken with the rest of the flock to prevent further cases developing. The chances of saving a ewe noticed with symptoms of sleepy sickness by giving extra feed depend entirely on how far the disease has developed before it is noticed. In the very early stage a dose of molasses, $\frac{1}{2}$ to 1lb., and a shift to green feed may prevent death. There is no special substance in molasses which is beneficial in the prevention of any particular type of disease; molasses is merely a readily available form of energy. It is much more practical to have other and cheaper food available. If nothing else is available, molasses can be a useful, but expensive, source of food.

Symptoms usually develop gradually. Symptoms in the very early stages of the disease can be seen if a mob of sheep is driven quietly round the paddock; an affected sheep lags behind, and if forced to move, shows an unsteady gait. As the disease progresses the ewe appears to become increasingly unaware of her surroundings. She may stand for several hours in the same position, with the head held high and often moved to one side, as illustrated in Fig. 4, or she may assume a dopy attitude with her head hung down (Fig. 5). At this stage it is possible to walk right up to the ewe without her making any real attempt to move away. Blindness, usually in both eyes, is a very common symptom and in many cases is the first abnormality noted by the farmer. Probably the most striking feature is the unusual postures which an affected ewe will adopt. Later the ewe goes down, becomes semi-comatose, and may remain in this condition for several days. Death may occur from 36 hours to about 8 days after the first symptoms develop.

When the carcass is opened up the liver is generally found to be much paler than normal owing to an excessive accumulation of fat. Examination of the blood and urine from affected ewes taken before death usually reveals a condition known as ketosis. This is an indication that the animal is drawing excessively on her own body reserves. However, ketosis commonly occurs without any symptoms developing, and some animals affected with sleepy sickness show very little evidence of ketosis.

Possible Cause of Disease

It may well be that the important factor determining whether an animal is affected or not is her ability to switch over quickly enough from a state where the feed intake is sufficient for her requirements to one where she must draw on her own body reserves to meet her needs. If this change in the source of supply of nutrients is gradual, she is able to cope with the situation, at least for a time. If, however, the demands on her body reserves go beyond a certain level, she is again unable to meet them. This, however, is merely a hypothesis, and it would need

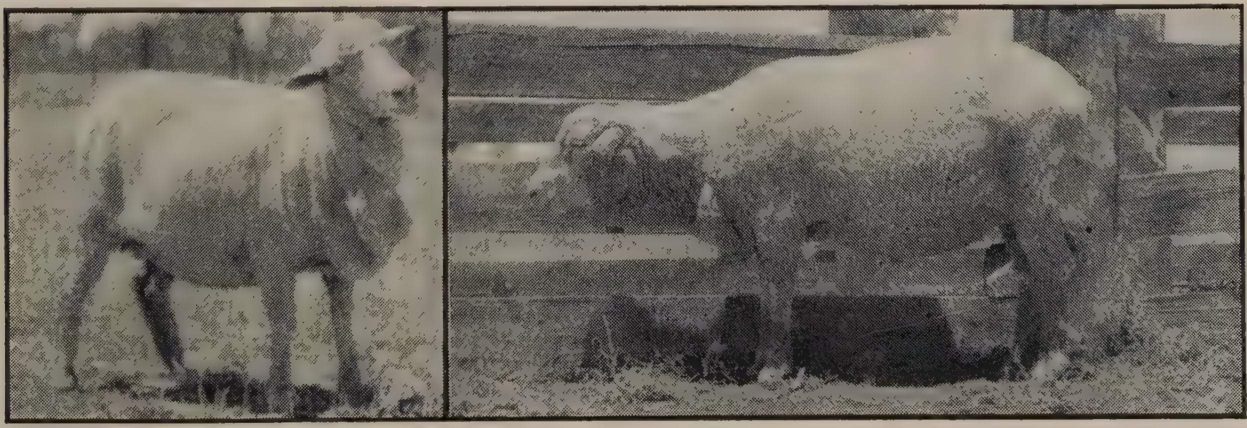


Fig. 4 (left)—Ewe showing early symptoms of sleepy sickness. Fig. 5 (right)—Ewe with sleepy sickness showing typical dopy attitude with no interest in her surroundings.

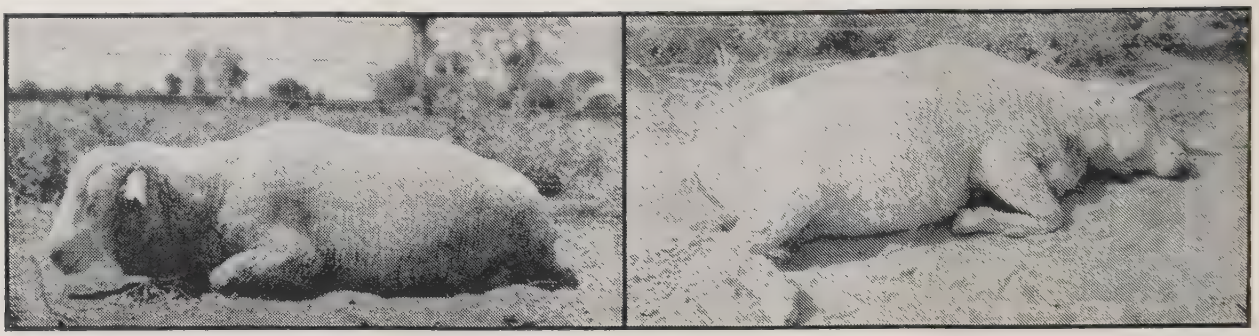


Fig. 6 (left)—Ewe affected with milk fever. Fig. 7 (right)—Ewe in more advanced stage.

to be supported by a better understanding than exists at present of the physiological mechanism controlling the animal's ability to mobilise her body reserves quickly.

What is certain is that sleepy sickness can be prevented by gradually increasing the level of feed intake throughout the last month of pregnancy.

MILK FEVER

Milk fever in ewes, or lambing sickness, bears some resemblance in its clinical symptoms to sleepy sickness, and the two conditions are often confused when first encountered. As with sleepy sickness, older ewes are more susceptible to milk fever. It is important, however, to be able to differentiate between the two conditions, because milk fever, unlike sleepy sickness, is readily amenable to treatment.

Milk fever in the ewe is associated, as it is in the cow, with a sudden fall in the calcium content of the blood, and both in-lamb and lactating ewes may contract the disease. Under certain circumstances the disease may occur in any type of sheep. It is more common before and just on lambing. In the South Island it has occurred at shearing time after the mustering and yarding of sheep.

Outbreaks in Waikato

Though milk fever occurs less frequently than sleepy sickness and is therefore of less importance, in several outbreaks in the Waikato up to 30 per cent. in the mob were affected.

In one outbreak a mob of stud Southdown ewes in good condition were brought into the yards for crutching just before lambing. They were left in the yards overnight, and the next morning the owner found 15 ewes in various stages of the disease, some of them lying flat on their sides and unconscious. A further 40-odd cases occurred during that same day after the ewes had returned to their paddock. All but two, which were the first cases to occur, recovered promptly after treatment.

Yarding of ewes which are close to lambing is the commonest cause of milk fever in the Waikato. Franklin's work on calcium metabolism in sheep in Australia has shown that quite short periods of fasting may be followed by a sudden drop in blood calcium.

Milk fever may also be associated with droving in-lamb or lactating ewes, though in experiments carried out by Franklin only those ewes in which the blood calcium was already below normal developed symptoms of milk fever after exercise.

Another common predisposing cause is a sudden change to lush feed.

Features which distinguish milk fever from sleepy sickness are: Milk fever is more likely to occur after a mild winter with ample lush feed available than is sleepy sickness. It is also much more dramatic in its onset in that often several ewes are suddenly affected within a few hours and symptoms develop rapidly.

In the early stages an affected ewe walks with a staggering gait, due to a stiffness of the hind legs. She often appears nervous and distressed, and when disturbed may shiver or tremble. Such symptoms are often transient and are frequently missed. She soon becomes drowsy and goes down (Fig. 6), often lying with her head turned to the flank; or the ewe may lie on her chest with hind legs straddled out behind and the head stretched out in front. Consciousness is soon lost (Fig. 7) and death may occur within 4 to 6 hours or up to 48 hours. Because of this rapid onset, sheep are often found in varying stages of the disease.

Treatment

Injection under the skin with 40 to 80 c.c. of a 20 per cent. solution of calcium borogluconate is extremely effective—the response, even in advanced cases, is usually spectacular—and should always be attempted where there is any doubt whether the animal is affected with sleepy sickness or milk fever.

Ewes treated for milk fever have sometimes borne dead lambs. Veterinarians sometimes consider it necessary to give magnesium as well as calcium to avoid causing the ewe's death through heart failure, and this may have some bearing on the death of the lamb. A veterinarian who had treated a number of ewes for milk fever used to give the injection into the vein and the lambs were usually born dead. He started giving it under the skin in small doses and there was a marked reduction in the number of dead lambs. Giving a small dose and repeating this dose several times seems to reduce the number of dead lambs.

Dr. C. S. M. Hopkirk Appointed to FAO Position

DR. C. S. M. HOPKIRK, veterinary adviser to the New Zealand High Commissioner in London since 1948, who has completed 40 years' service with the Department of Agriculture, has accepted an appointment as Mission Chief in Ethiopia for the Food and Agriculture Organization of United Nations. Dr. Hopkirk left London to spend a month in Rome before beginning his new duties in Ethiopia on 1 August.

DURING a distinguished career with the Department of Agriculture Dr. Hopkirk made many valuable contributions to knowledge of stock diseases in New Zealand. He has been closely connected with research into mastitis, facial eczema, black disease of sheep, and sterility problems.

In 1945 Dr. Hopkirk was appointed senior veterinary officer for UNRRA in Europe and China, a position he occupied for 2½ years. His duties involved the procuring of veterinary supplies and the rehabilitation of production laboratories, research and diagnostic stations, and veterinary schools in many war-ravaged countries.

One of Dr. Hopkirk's most important tasks was to plan the establishment of a veterinary division in Ethiopia—an innovation in a country where stock disease is very high. He was invited to implement his plan, but declined the position offered him.

After graduating Bachelor of Veterinary Science with first-class honours at Melbourne University in 1923, Dr. Hopkirk returned to New Zealand as Officer-in-Charge of the Department's Wallaceville Veterinary Laboratory, as it was then known. He continued his close association with research at Wallaceville, which in 1939 was incorporated in the Department's newly formed Animal Research Division and was named the Wallaceville Animal Research Station.

A thesis on mastitis in dairy cows gained Dr. Hopkirk the degree of Doctor of Veterinary Science from the University of Melbourne in 1934.

In 1938 he made a world tour on behalf of the Department of Agriculture, visiting all the important veterinary research stations abroad and representing New Zealand at the first Imperial Veterinary Congress in London and the International Veterinary Conference in Switzerland.

Dr. Hopkirk's new appointment in Ethiopia is for 1 year, with the option of renewing it for a further term.

HEADING PHOTOGRAPH: A dairy by-product feed supply is ideal for the production of light porkers such as these. British authorities are satisfied that, if quality is maintained, the New Zealand porker will continue to be in demand.

Increased Prices Incentive to More Pig-meat Production

REAL incentive to produce more pig meats has been given through the increase in price which has been operative since 4 August 1952. This increase, amounting to a total of 3d. per pound, is the largest ever secured at one step. The price paid to farmers now represents the full realisation under the United Kingdom contract, and this article by A. Longwill, Superintendent, Pig Industry, Department of Agriculture, Wellington, discusses some considerations arising out of the changed economic outlook for the pig industry.

AN increase of approximately 20 per cent. in the price producers will receive for their pig meats this season as compared with last must have a considerable influence in stimulating renewed interest in pig production. In two seasons the price for light porkers has increased by 66 per cent. and for premium baconers by only slightly less than this.

Under the new schedule the top price for a porker will be £7 and that for a baconer (160lb.) will be £11. The most profitable weight ranges to aim at will be under 80lb. for porkers and between 150 and 160lb. for baconers. The 80lb. porker, returning £6 3s. 4d., is the most profitable porker to produce, as the differentials on the higher weight ranges of porkers make these weights less attractive.

Although the gross return at the top of each successive weight range exceeds that for the 80lb. porker, the food cost to obtain the extra gain would outweigh the monetary return. The production plan should therefore be to market all pigs either between 70 and 80lb. dressed (porkers) or between 140 and 160lb. (baconers).

As long as the flush of milk persists the bulk of pigs can and should be carried on to the baconer weights. Some of the shorter, thicker types of pigs may be picked out at porker weight, however, if the total stock position is such that those left to grow on to baconer stage will be able to consume all the food available. Later in the season, when dairy by-product supplies are falling off, fewer baconers will be produced, the bulk going as porkers if a home-breeding two-litter system is practised.

Advantage of Weighing Pigs

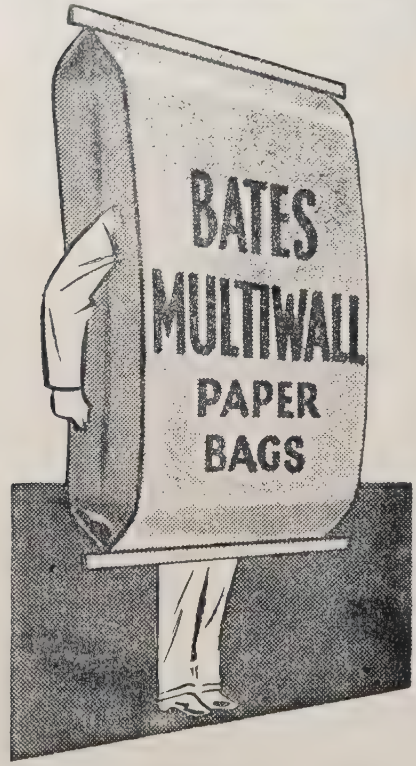
Where hooks selling is practised the use of scales to check the progress of, and to help to decide when to market, pigs will be well worth while. With substantial differentials in operation it is important not to exceed the maximum weight of the premium range by a pound or two, thereby suffering the price penalty. Most operators are working on smaller differentials than those in the official schedule and some provide a small weight tolerance at the top of the premium weight range. Where these practices are followed the incentive to produce carcasses in two well-defined and fairly narrow weight ranges is, of course, reduced.

As the maximum price paid under the narrower differential schedule is lower than that of the official schedule, the careful producer who is prepared to go to the trouble to ensure that his carcasses fall within the premium range is entitled to see that he is paid for them at full official schedule rates; that is, the price the operator receives for these from the New Zealand Meat Producers Board. He would, however, have to be prepared to take the lower official rate for the less preferred weight ranges. The average producer would wind up at the end of the year with the same return either way. The producer who gets more than the average proportion of his pigs in the premium ranges would benefit from the higher differentials. The producer who gets less than the average proportion of his pigs in the premium range benefits from the smaller differential schedule.

Operators can, and do, argue that the high differentials have no relation to the value which is at present realised for the carcasses. This refers particularly to porkers, for which there is a steep differential over three fairly narrow weight ranges. The National Pig Industry Council executive committee when recommending on the weight range differentials in the schedule was fully alive to this argument, but feels that from a long-term consideration the encouragement of production of the 70 to 80lb. porker for export, with the bulk of the baconers in the range 140 to 160lb. going into the local market, is the wise policy to plan for. Any departure from the official schedule in smaller differentials is therefore undermining this policy, as it provides less incentive to the producer to take care of the weight range in which he finishes his pigs.

The narrower the weight range defined as the desirable one for which a premium is offered the higher the initial premium can be and the more likely is it to result in a uniform line of carcasses. The experience of Denmark, where all pigs for export

RIGHT DRESS FOR FERTILIZER



BATES MULTIWALL PAPER BAGS ARE THE FIELD SERVICE DRESS FOR FERTILIZER—LIGHT, HANDY, TIDY, STRONG.

112lb. to the bag, they're easy to lift and carry. **Bates Multiwall Paper Bags** open quickly, and empty at one tip. Nothing is left clinging to the walls and the contents are in perfect condition—dry and free from lumps. There's no "leakage" when you lift and your sheds are free from dust.

Bates Multiwall Paper Bags are such a boon. You should really see your Merchant about them.

BATES MULTIWALL PAPER BAGS

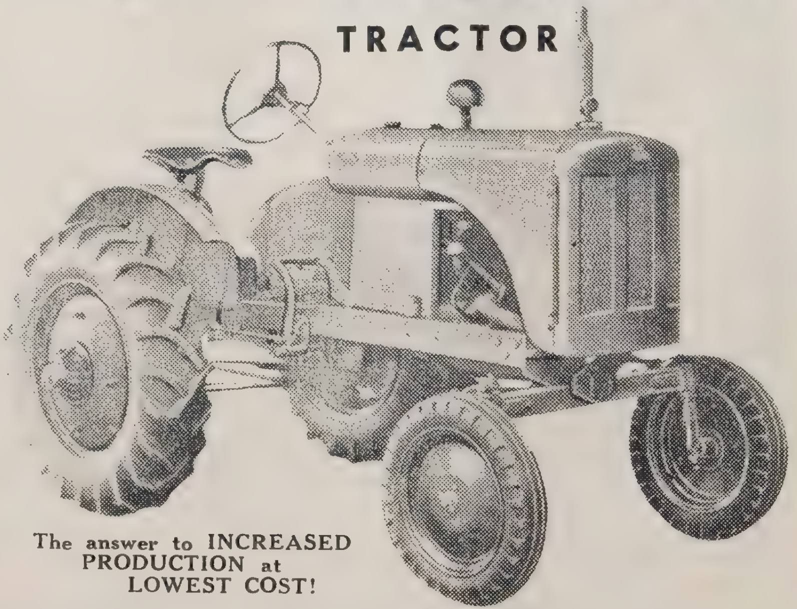
Made to Bates St. Regis Specifications.
Address Enquiries to the Manufacturers
N.Z. FOREST PRODUCTS LTD.
(Multiwall Bag Division)
PENROSE - - - AUCKLAND

52.1F

MR. FARMER! ***Buy from your best customer!***

THE FAMOUS BRITISH

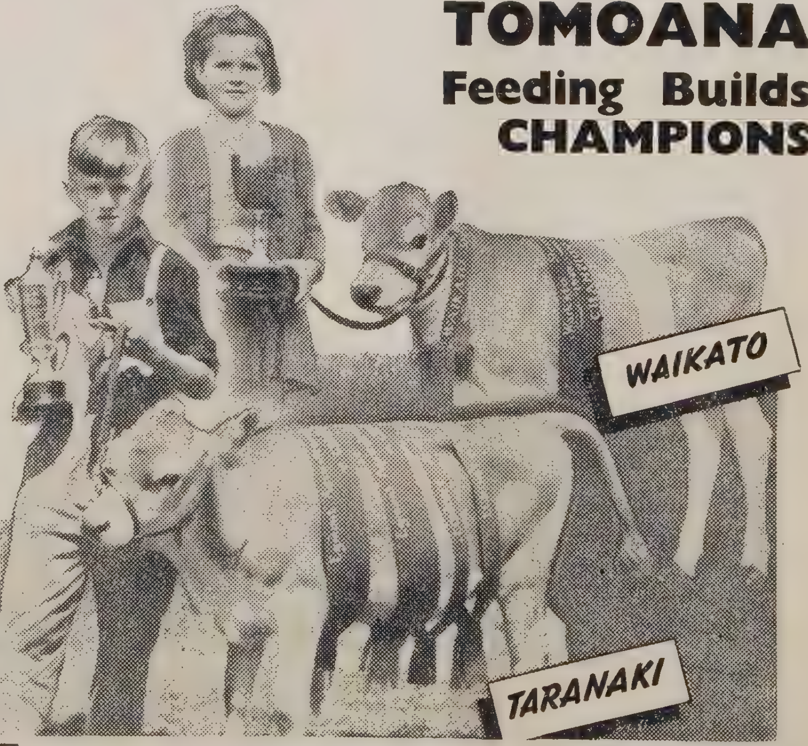
B·M·B PRESIDENT TRACTOR



The answer to INCREASED PRODUCTION at LOWEST COST!

DEALERS IN ALL MAIN CENTRES.
N.Z. Distributors: AGRICULTURAL CULTIVATORS (N.Z.) LTD., P.O. Box 1102, Auckland.

TOMOANA Feeding Builds CHAMPIONS



Feed **TOMOANA** *Calf Pellets*
or **TOMOANA** Milk Solids **CALF MEAL**

before the war were killed within a narrow weight range (33lb.), is the classic example of this.

New Level of Cash Returns

Gross returns from pig-meat production on the dairy farm will automatically be 20 per cent. higher than last year, and if this increase results in increased productive endeavour, the gross returns which are possible will be higher still. Returns of £10 per cow from pigs have been reported in recent years, and such returns should now be commonplace. On the home-separation farm skimmed milk alone is capable of producing 40lb. of pig meat per 100lb. of butterfat. This places its gross value at £7 to £8 per cow. If there is reasonable supplementing with home-grown crops and grass as well as purchased concentrates, the gross return of £10 per cow is within reach of every skimmed milk feeder. This is equivalent to 9d. to 10d. per pound of butterfat. If whey is fed, the gross return should be half this. The net farm return, after deduction of cash outgoings for supplementary feed and other items, should be between 7d. and 8d. per pound of butterfat on skimmed milk and 3½d. to 4d. on whey.

As the price of pig meat increases the limits of profitable meal feeding are raised unless the prices of these concentrates rise to compensate. With the latest meat price increase the balance has swung, temporarily at least, in favour of the pig. Meals at 2½d. to 3d. per pound may be used as far as present supplies permit for supplementing the winter food supply of sows and suckers and for weaners. At the end of the season, when the choice is between finishing to light pork weights on meal and carrying as stores over winter, the use of meal and marketing the pigs as light pork would usually be more economic. This depends to a certain extent on the method of providing the pigs for spring and the above recommendation is in line with the advocacy of the Department of Agriculture of concentrating farrowings in May to June and again in November to December and reducing the carrying of winter stores to a minimum.

Up to porker-weight average pigs should be capable of putting on 1lb. of dressed meat for every 5lb. of food consumed. If it is assumed that all the food used is bought at 3d. per pound, the total food cost per pound of gain (deadweight) is 15d. Thus, although this would not leave much to meet such expenditure as overhead and labour costs, it is obvious that if only a short period of feeding on meal to finish otherwise unmarketable pigs is required, this would be profitable. The feeding of ½cwt. of meal to the sow during pregnancy, creep feeding up to the level of ¾lb. per day at weaning, and use of meal to get the weaners well started will cost 15s. to £1 per pig to the porker stage and will be well worth while.

Meal supplementing in the creep and to get pigs safely over the weaning stage has been consistently advocated as sound practice; today it is essential to get the most economic return. Similarly the production of crops on the farm to assist in the wintering of sows and their litters and as an insurance against a short dairying season becomes a still more attractive proposition while such food is produced at a unit cost lower than that at which concentrates can be obtained.

New Zealand pigs generally are not of specialised bacon type; some variation exists. The earlier-maturing types should be marketed as 70 to 80lb. porkers, and, as far as food supplies permit, the longer, bacon-type pigs taken on to 140 to 160lb. carcass weight.

Other Uses for Dairy By-products

Though the general argument in favour of processing dairy by-products for direct human consumption must be held valid, the marketing of these by-products must be able to show a better return than can be obtained by feeding them to pigs if they are to remain attractive to the producer.

The efficient pig raiser can secure from his pigs 8d. per pound of butterfat above butter, whereas it is unlikely that his pay-out from dried skimmed milk would be more than 4d. per pound of butterfat. On a 12,000lb. butterfat farm the difference is £200. The decision whether a change from pig production to the processing of the skimmed milk would be good business (after the net return from the powder is known) would depend on individual circumstances. Chief among these would be whether the labour at present devoted to pig production could be saved or transferred to the provision of the means to increase production from the dairy herd, pasture improvement, more intensive fertiliser practice, strip grazing, irrigation, etc.

Where such practices are followed on a fully improved farm there is sufficient intensification of production generally to warrant carrying an extra labour unit if the return from pigs is available to go toward his wages. There may be intermediate cases where the choice to cease pig production in favour of processing the dairy by-product is sound, but on most farms where pigs are still being produced thorough examination of the pros and cons would reveal that on present market levels the pig can hold its own with the competing uses of dairy by-products.

There is the further consideration of the soundness of the various markets. Though theoretically milk powders should have a very wide market, there is no price guarantee and the returns from a wider market might be uneconomic. In the post-war years there has been some indication of how rapidly the market may change. On the other hand meat—and fresh meats in particular, of which pork is one—is likely to be in steady demand for many years. Although pig meats are not included in the 15-year agreement with the United Kingdom, it is felt that as long as quality is competitive there will be a market for New Zealand porkers at a remunerative figure. There is already an indication that at present prices the market in Britain for bacon is for something less than the 5oz. ration which has recently been available there but which has not been fully taken up.

Importance of Quality

Grading of baconers with a premium for quality will be introduced in the United Kingdom as from 1 September and it is therefore certain that the market for baconers will become more selective. New Zealand porkers have always been more acceptable than baconers in Britain and there has already been a move by offering the 2d. premium on porkers in the United Kingdom contract price to encourage the sending of more meat in the porker-weight ranges.

New Zealand should concentrate on porkers for export and aim to produce baconers only to the extent demanded on the local market. Efforts to maintain an improvement of carcass quality should be vigorously renewed. Lack of any incentive to production of quality meat in recent years has had a demoralising effect on the industry and this should not be allowed to continue. As long as there is quality in production the prospects for pork producers seem bright.

this new nozzle

on

MANNINGS

original

single-squeeze tube

Thinner and smoother than ever before . . . this new nozzle on Mannings Penicillin Udder Injection cannot harm the delicate tissue of the cow's teat. It makes it easier, too, for you to inject the tube.

MANNINGS

PENICILLIN

udder injection

Keep Mannings always on hand to combat MAMMITIS immediately.

Obtainable throughout New Zealand.

Farm proved—and backed by the 60 years' veterinary experience of MANNINGS LTD., HAMILTON

Britain's Newest
aid to
Tractor Powered
Farming

N.Z. Distributors:
THE DOMINION MOTORS LTD.,
P.O. Box 590, Wellington.
Representing: **NUFFIELD EXPORTS LTD.**
(Chairman: Viscount Nuffield)

DESOUTTER

Electric and Pneumatic

PORTABLE POWER TOOLS

Additions to the range are the

TWO SPEED ½in. ELECTRIC DRILL
TWO SPEED ⅝in. ELECTRIC DRILL

FEATURES: **High and Low Speed — over .35 h.p.**
Weight approx. 10lb.

N.Z. Agents

de PELICHET, McLEOD & CO. LTD.

P.O. BOX 205 :: HASTINGS

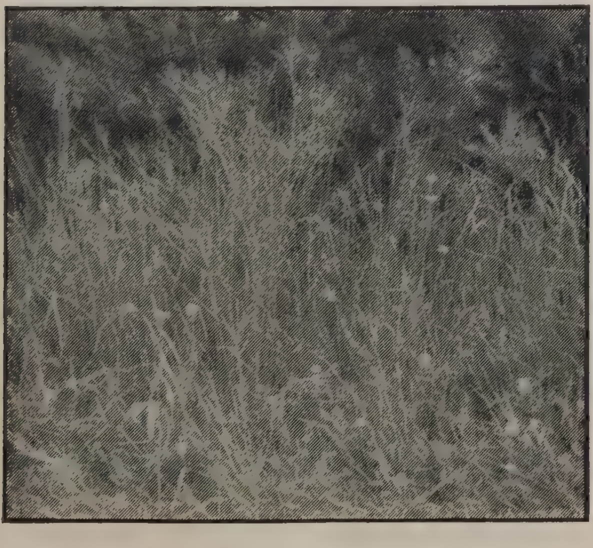
Rust of Linseed and Linen Flax: Life Cycle and Control

LINUM rust (*Melampsora lini* Ehrenb.), a disease of linseed and linen flax, was first recorded in New Zealand by Cunningham in 1927 (1), since when it has occurred to a greater or less extent each season. In 1947-48 a rust epidemic in Canterbury seriously threatened the survival of the linseed and linen flax industries. Since then they have recovered, the area in linseed being over 30,000 acres in the 1951-52 season. Further expansion is expected as farmers learn more about the crop, but rust still remains a serious annual hazard. Recent surveys and research have suggested ways in which the danger can be lessened. These control methods depend on a knowledge of the different stages in the life cycle of the rust fungus, and in this article these stages and the control methods are described by I. A. M. Cruickshank, Plant Diseases Division, Department of Scientific and Industrial Research, Auckland.

A susceptible linseed variety heavily infected with uredosori of rust.

THE life cycle of linum rust has four distinct stages, all of which occur on cultivated and wild species of *Linum*. The first obvious signs of rust in a crop are orange pustules or uredosori (illustration at right). This phase may be observed from early summer to late autumn on crops, and on volunteer plants and wild flax throughout the year. Minute orange spores are produced continuously from the pustules for several weeks at the rate of several millions each day. Uredospores may infect other plants in the stand or they may be carried many miles by air currents to other crops of linen flax or linseed. The time required from infection for the production of fresh uredospores is 10 to 12 days. Thus every 10 to 12 days throughout summer this short cycle repeats itself and the rust fungus multiplies rapidly. However, crops are susceptible only while green and growing vigorously; once they change colour they become resistant to further infections.

In late summer the second or teleutosorus stage appears as black pustules on stems previously infected with the orange phase. This is the over-wintering stage. In early spring (September - October) teleutospores making up the black pustules germinate and produce minute colourless spores which are shot into the air. If these spores alight on a flax leaf or stem they penetrate the tissues and there develop the third or pycnidial stage.



Plants of Australian flax (*L. marginale*) growing along roadside.

Pycnidia appear as minute, pin-point spots in small orange areas on leaves and stems in early spring. They produce large numbers of sticky spores and are an important phase of the sexual cycle of the fungus. A few weeks after pycnidia have appeared the fourth or caemosoral stage develops from the mixing of spores or fungous threads of two pycnidia. Orange powdery spores are formed by caemosori and are spread in the same way as uredospores, and the life cycle is complete.

The first and second stages are most readily observed and cause directly the most damage. The third and fourth stages, although not conspicuous, are equally important, as they not only assist survival of rust from one season to the next, but may also play a part in development of new and more damaging races of rust.

Recent studies have shown that there are at least 12 races of this rust fungus in New Zealand, and that most of them are widely spread throughout districts where linen flax and linseed are grown. This information is being used in the breeding and selection of new rust-resistant varieties of both crops. The time new varieties may remain resistant after they are released depends on many factors. One of the most important is the ability of rust to produce new races which will attack them. This largely depends on the abundance and distribution of the third and fourth stages of the life cycle, and indirectly on the amount of volunteer linseed, linen flax, and wild *Linum* growing through winter.

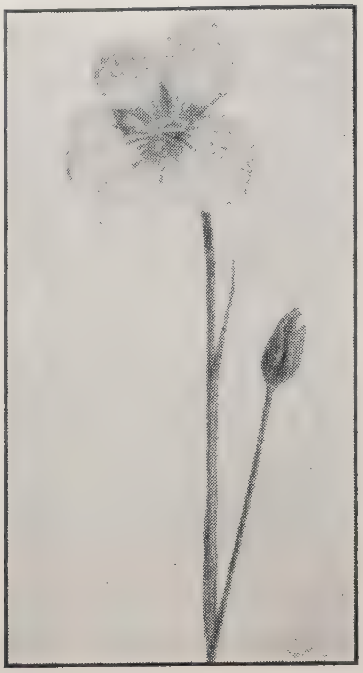
Surveys made during spring for the last 4 years in North Canterbury and South Canterbury have shown the presence of large quantities of Australian flax (*Linum marginale* A. Cunn.) (illustrations at left and on next page) growing alongside roads and railways and on waste land. Plants in many instances were heavily infected with rust in both uredosorus and teleutosorus stages. They were also commonly infected with two other diseases of *Linum*, namely pasmo (*Sphaerella linorum* Wollenw.) and browning (*Polyspora lini* Laff.). As *L. marginale* grows throughout the year, it is a serious carrier of rust and other diseases from one season to the next. Native flax (*L. monogynum* Forst. F.) has also been found infected with rust, but this species is not as common as *L. marginale*, being confined to coastal areas.

The surveys have also shown the presence of rust-infected volunteer linen flax and linseed plants in fields sown with these crops the previous season. The practice of sowing down grass with linseed crops has an important bearing on this problem, as the growth of volunteer plants through the following winter may remain unchecked. Equally dangerous is the practice of sowing linseed "seconds" with autumn greenfeed crops. If plants from this source become infected with rust, they are a serious menace to the following season's spring crops. This was well illustrated in 1948, when the autumn crops of 1947 spread large amounts of rust to the following season's spring sowings and a rust epidemic was experienced.

The practices mentioned would be less dangerous if such areas were heavily fed off through winter and again in early spring. Observations have shown that where this has been done few linseed plants survived. However, because of different seasonal feeding requirements, it is almost impossible to guarantee sufficiently heavy grazing to eliminate all linseed plants.

Control of Rust

The ideal method for controlling rust is the growing of resistant varieties. Varieties at present grown have been shown to be much more rust-resistant than those grown before 1947 (2). Further selections of even more resistant types within these varieties have been made and it is hoped to release two lines for field trials in 1953. A



Flower of Australian flax (*L. marginale*).

breeding programme for rust resistance in the linseed variety Golden Viking and the linen flax variety Liral Crown, initiated in 1949 by the Crop Research Division of the Department of Scientific and Industrial Research, is progressing favourably.

The farmer himself has power to reduce greatly the chances of a recurrence of severe rust epidemics. Measures listed below will reduce spring infections and at the same time reduce the risk of new races of rust developing.

1. Eradication of wild flax alongside roads and railways adjacent to farms. Pulling and destruction of these plants before they set seed is the best method of removal. They are readily recognised when they come into flower (see illustration above).
2. Eradication of volunteer linen flax and linseed plants from cropping land by autumn ploughing and working and from pastures by heavy winter and spring grazing.
3. Sowing of spring crops of linen flax and linseed as early as practicable within the limits of the locality and season, preferably not later than the end of October. Late resowing in November is inadvisable.
4. Practising a 3- or 4-year crop rotation.
5. Dusting of seed before sowing with a fungicidal seed dressing.

References

1. "Transactions and Proceedings of the New Zealand Institute", vol. 58, pp. 47-50, "Fifth Supplement to the Uredinales and Ustilaginales of New Zealand", by G. H. Cunningham (1927).

2. "New Zealand Journal of Science and Technology", vol. 31, No. 6A, pp. 54-57, "Resistance of Linseed and Linen Flax Varieties to Flax Rust (*Melampsora lini*) in New Zealand", by I. A. M. Cruickshank (1950).

BOOK REVIEW

"The Grass Crop": William Davies

TO many people "ecology" is merely another scientific term, the significance of which can be appreciated only by scientists. That this thought is fallacious is shown in "The Grass Crop", a book of over 300 pages. The author demonstrates that to farmers, research workers, and extension workers an ecological approach to the study of grassland is essential. He shows, by argument based on wide observation and experiment, the extent to which good grassland husbandry throughout the world is based on an appreciation of the interdependence of the soil, climate, plants, and animals (including humans).

To establish certain principles, example, and argument he does not always follow conventional "grassland" lines. For instance, penguins on the coast of the Falkland Islands are used as one example of the extent to which the animal factor can change a type of vegetation.

The book is based on two main themes: First, there is the ecological theme, which answers many "why" rather than "how" questions about grassland. This theme should be of interest to everyone interested in grassland, as it deals mainly with principles which may be converted to practice in many areas. Second, there is the advisory theme, in which advice is given principally to farmers in Britain on matters such as pasture establishment, management, use of strains of pasture plants, and seed production.

In the preface the author states that he is writing for the intelligent rather than for the academic person and that he uses argument rather than numercial data. For this reason the research worker will find little in the way of figures with which he can compare his own results. This, however, is compensated for to some extent by a comprehensive bibliography of over 600 papers, many by the author.

Dr. Davies is a keen advocate of the policy of ploughing up old and poor grassland and resowing to short-term pastures. He estimates that 65 per cent. of Britain's permanent grassland is poor and that if this land were adequately utilised, production from it would be trebled. A parallel argument could well be applied to many of New Zealand's older pastures.

The book states that for a long time it was assumed that grass would grow only in its season and could not be made to alter its ways. Recent research which has been and is being put into practice shows that this assumption is wrong. For example, by the use of various species and strains of pasture plants the production period of pasture can be changed to the farmer's advantage. Autumn-saved pasture and break feeding carry growth well into winter. "Early bite" is provided by the stimulation of growth with nitrogenous fertiliser out of the bag, by the holding of autumn-grown cocksfoot, and by the use of cereals and cruciferous crops.

The importance of the biotic factor to hill (or marginal) lands is pointed out. Hill country should be the rearing ground not only for animals but also for humans. Such land reclamation pays not the generation that does the work but the generation that follows.

Among the many points of interest dealt with are the following: That in general depletion and erosion can be cured by the better use of pasture and livestock; that in research observing results is often easy, but ascertaining causes may be difficult and time absorbing; that without the application of research "we may not have held out on the food front in 1942-43"; that the problem of national grassland is one of maintenance rather than one of improvement; that the treatment applied to a type of vegetation determines its character and composition; that there is no experimental evidence to show that herbs have any value in adding to animal output from pastures; that the greatest problem in tropical grassland research is that there is no appropriate legume.

When the wide range of territory and subjects covered is considered the paucity of illustrations is surprising. Of the objectionable but ubiquitous hat, matchbox, and ruler, the last-named has been chosen to grace an illustration used on the dust cover and as the frontispiece. Good and ample illustrations not only make a book such as this more informative but also more readable; nine illustrations only do not do justice to the book.

—*S.H.S.*

E. and F. N. Spon Ltd., London. 26s.

Editor: Professor H. I. Moore

THE
JOURNAL OF THE BRITISH GRASSLAND SOCIETY

This Journal is a medium for the publication of the results of research and practical experience in the realm of Grassland Husbandry.

CONTENTS OF VOLUME VI, No. 4, 1951

1. A Quantitative Method for Determining Palatability of Pasture Plants. *David Reid.*
2. Studies on the Roots and Storage Organs of Herbage Plants. *Arthur Troughton.*
3. Microenvironment in relation to Experimental Techniques. *Stella S. Williams.*
4. The Effect of Heather on the Rate of Growth of Hill Lambs. *J. N. Peart.*
5. White Clover Trial. *A. G. Davis* and *M. M. Cooper.*

This Journal is published quarterly. Subscription, Vol. I, 15s.; Annual Subscription thereafter, 30s. per volume. Orders to

THE SECRETARY, BRITISH GRASSLAND SOCIETY, 69 MAY STREET,
BELFAST, NORTHERN IRELAND.

Shallots: An Easily Grown Crop in Home Gardens

By A. G. KENNELLY, Horticultural Instructor, Department of Agriculture, Dunedin

THE shallot (*Allium ascalonicum*), a member of the onion family, is rarely grown commercially in New Zealand, but deserves to be grown more widely by home gardeners because it is easy to raise, requires very little attention, has a milder flavour than most varieties of onion, and under any but the poorest conditions it yields well.

THE shallot is a hardy perennial which as it grows sends up numerous fine, hollow, awl-shaped leaves 8 to 15in. long. It seldom produces seed and is usually perpetuated by replanting the bulbs or offsets which are produced in clusters on the soil surface. There are several selections or varieties of shallots in commerce which differ in size and colour of bulb, but the commonest type has a bulb about the thickness of a walnut or a little thicker, is pear shaped, about 2in. long, narrowed in the upper part into a rather long point, and is enclosed in a tough skin russet coloured, often coppery red toward the base, and usually wrinkled lengthwise. Under the outer skin the bulb is greenish at the base shading to grey or even purple at the top.

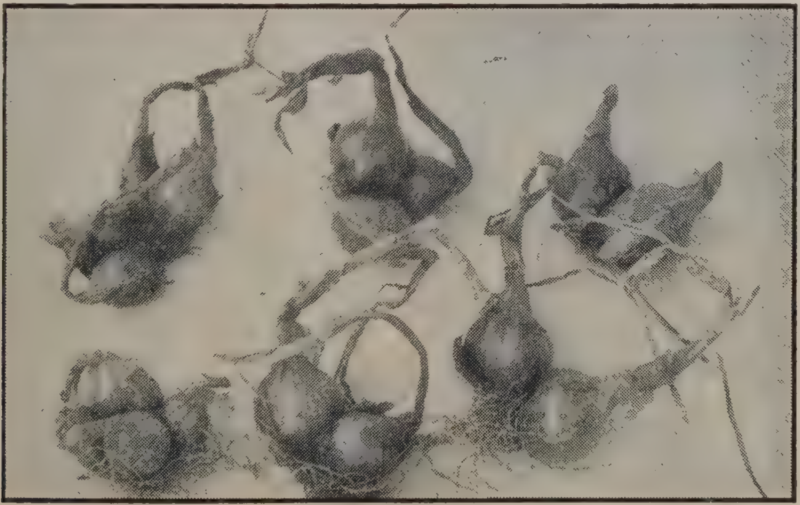
Among the larger kinds of shallot which have been much improved by selection are those known as the Russian shallot (syn. Large Brown, Large Red) and the Jersey shallot, the bulbs of which may grow up to 2in. in diameter and weigh several ounces. Named varieties of shallot are not generally available in New Zealand and obtaining the better varieties is usually a matter of chance or selection.

In the simplicity of its culture, its vigour, yield, and freedom from disease the shallot compares favourably with the commercial onion. Its only disadvantage is its smaller bulb. Its common name, shallot, dissociates it in the minds of many from other members of the onion family and often prejudices its use in place of the onion, yet apart from its characteristic habit of growth the shallot is readily confused by most people with smaller specimens of many varieties of onion, and the less common varieties of onion such as the multiplier or potato onion (*A. cepa* var. *multiplicans* Bailey) are occasionally grown under the misapprehension that they are shallots, some varieties of which multiplier onions closely resemble.

Though botanically, and in this article, shallot is used as the common name of the plant *Allium ascalonicum* and its varieties, overseas the word shallot is used to some extent as a common or vernacular name to describe several different but closely related plants.

Soil and Manure

Shallots succeed in almost any garden soil, but prefer a well-drained, fertile soil rich in well-rotted organic matter. Heavy clay soils that dry out excessively or are poorly drained are least likely to give good results. Manurial requirements are moderate and shallots grow well in soils that were heavily manured for a previous crop. Where additional fertiliser is needed a dressing of equal parts of blood and bone and superphosphate applied at 2 to 4oz. to the square yard, according to the fertility of the soil, will usually give good results. In districts of average to high rainfall growth in most soils not recently limed is likely to be improved by carbonate of lime at 3 to 4oz. to the square yard, preferably well worked in some time before planting. To avoid the build-up of disease crop rotation should be practised. Shallots should not follow other members of the onion family.



[Jack Welsh and Sons photo.

Shallots are miniature members of the onion family and can be used as substitutes for onions in most dishes which customarily include onions. They are mild in flavour and especially useful for pickling.

[Green and Hahn Photography Ltd. photo.

A row of shallots is an asset in most home gardens. There are several varieties, which vary a little in size and bulb colour, but all are easily grown and yield well.

Planting

Traditionally shallots should be planted on the shortest day and harvested on the longest, but if soil conditions are favourable, they can be planted any time from late autumn until early spring. The keeping quality of different varieties varies. Some start growing much earlier than others, and if held out of the ground, should be planted before they exhaust themselves producing leaves, though usually under good conditions even specimens that have become very wizened will produce a good crop.

Soil should be cultivated to a fine, friable tilth and firmed. The rows should be marked or drills drawn and the bulbs or cloves, graded to size, should be pressed far enough into the ground to stabilise them, usually ½in., though deeper planting, even up to the neck, is sometimes preferred. Bulbs should be set 5 to 8in. apart, according to the vigour of the variety, in rows not less than 12in. apart. They soon develop roots and as they grow divide into a number of cloves or offsets which remain attached at the base. There is little advantage in planting large bulbs unless a great number of small cloves are wanted. Medium to small, though not excessively small, bulbs do not generally yield as heavily as large bulbs, but they usually yield more large bulbs.

Shallots can be grown from seed sown in spring as onions are. Seed has not been noticed listed in local catalogues, though it is listed in some from overseas. Such seed, however, is rarely that of the true shallot. Usually it is seed of a small variety of onion, which if left in the ground, goes to seed as other onions do.

After establishment shallots should need no other attention than weeding; if the soil becomes compacted and aeration is restricted, cultivation may also be required.

Harvesting and Storing

In January or February, according to district, the foliage usually dies back and the bulbs can be harvested. Bulbs should be thoroughly dry, and if conditions are unfavourable for drying outdoors, they should be placed in a dry, well-ventilated situation under cover. Care should be taken to avoid sun scorch, which may damage the basal parts of the bulbs. When dry, bulbs should be separated from their clumps, cleaned of soil by rubbing, and sorted. Damaged bulbs should be removed and the remainder stored according to size in shallow layers in slatted trays or on fine wire netting in dark, well-ventilated storage. Unless storage conditions are very good and examination regular, it is not advisable to remove the dried leaves and loose, papery outer skin, because that material cushions the bulbs in handling, and if they are dry, tends to arrest the spread of rots by forming a barrier of inert material through which air can circulate.

Shallots are in demand mostly for pickling, for which they are particularly suited by virtue of their size, flesh texture, and mild flavour. In addition they can be used in soups, stews, and salads. Their green leaves may be used in sandwiches or salads as are those of spring onions or chives.

Pests and Diseases

Shallots are troubled by few pests and diseases. Those listed below occasionally cause damage, though shallots are rarely affected by them to the extent that onions are.

Thrips (*Thrips tabaci* **Lind**)

Thrips cause bleaching or silvering of the leaves by rasping the leaf surface and sucking the exuding sap, thus weakening the plant by depriving it of part of its power to manufacture plant foods. Thrips are minute, cigar-shaped, yellow or dark-brown insects usually about 1/25in. long. They can be controlled by D.D.T. applied according to the manufacturer's instructions or by H.E.T.P. at 1 in 800 (1 fl. oz. to 5 gallons of water).

Aphides (*Aphis* **spp.**)

Aphides ("greenfly") rarely trouble shallots except in store, where they occasionally infest the young shoots emerging from the bulbs. They can readily be controlled by spraying with nicotine sulphate or H.E.T.P. at 1 in 800. A little soap should be dissolved in the water if nicotine sulphate is used, and for the maximum effectiveness of that spray the air temperature should not be lower than 70 degrees F.

Bottom Rot or White Rot (*Sclerotium cepivorum* **Berk**)

Bottom rot is occasionally troublesome, usually where the crop has been grown on the same soil consecutively for several seasons. It is a fungous disease and can first be recognised by a stunting and yellowing of the leaves and a white or grey fungous growth at the base of the bulb. Later small black resting bodies about as big as a pin's head develop on the area covered by the fungus. The resting bodies may remain in the soil for many years. Control consists of long rotations of non-susceptible crops and the destruction of affected rubbish.

Neck Rot (*Botrytis* **spp.**)

The fungous disease neck rot is a much less serious disease of shallots than of onions, but in wet seasons or where the shallot bulbs are not properly dried before storing there may be some loss. The disease usually enters through damaged tissue on the neck of the bulb, spreading downward until the bulb collapses. The most effective control is crop rotation, the destruction of affected rubbish, care in handling at harvest, and ensuring that the tissues at the neck of the bulb are dry before the bulb is stored.

Yellow Dwarf (*Allium*) **Virus 1 Smith**)

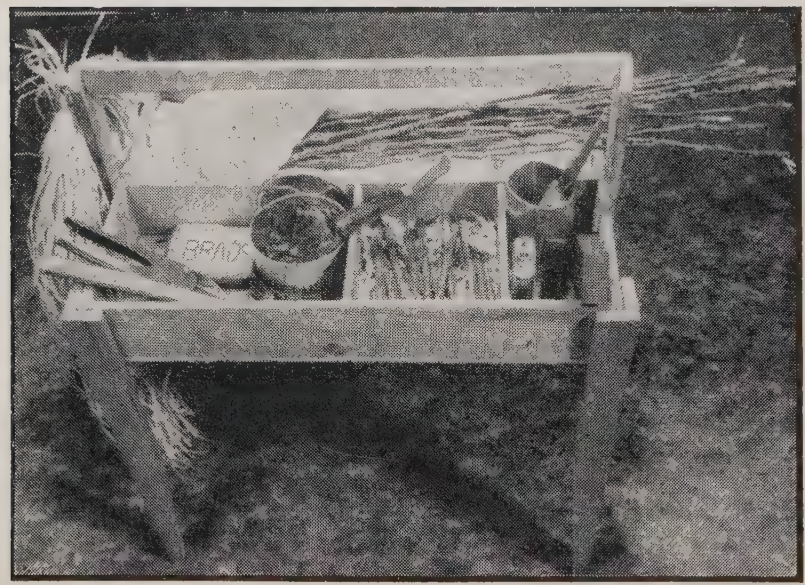
Several years ago the culture of shallots was forbidden in the Canterbury onion-growing area of Marshland, as it was shown that the virus disease yellow dwarf overwintered in them. This serious disease of shallots and onions stunts affected plants and causes the leaves to crinkle, droop, and turn yellow. Control consists of destroying affected plants and the insect vectors, mainly aphides, which spread the disease.

Smut (*Urocystis cepulae* **Frost**)

Smut is another destructive disease of onions and shallots confined to Marshland. It is a soil-borne fungous disease affecting young plants by causing dark lead-coloured stripes on the leaves (and later on the bud scales) which finally burst open and expose masses of black powdery spores which may remain in the soil for many years. Commercially the disease is controlled by using formalin in the seed rows. That may be necessary in the home garden, but while the affected area is limited the first essential in most gardens will be to avoid introducing the disease by examining all susceptible stock such as leeks, chives, garlic, onions, and shallots brought in and destroying it if infected.

Smut should not be confused with the fungous disease black mould (*Aspergillus niger* Tiech.), which is usually of minor importance, though it may cause some loss in bulbs stored in excessively damp conditions. On bulbs it can be distinguished from smut by the fact that the black powdery masses of spores are on the exterior of the scales and can be rubbed off easily, whereas bulbs affected by onion smut have oblong or linear black lesions near the base, usually as deep as the third or fourth scale.

Portable Stand for Grafting and Budding Equipment



By R. I. JUNE, Horticultural Instructor, Department of Agriculture, Hastings

WITH material usually available on an orchard construction of this handy stand that is useful for both budding and grafting is the work of a few minutes. The time taken in constructing the stand is soon offset in speeding up work in the orchard.

Considerable time can be lost in bending to pick up equipment from the ground each time something is wanted or in looking for tools in grass and weeds. Equipment is liable to be left behind in moving from one tree to another or it may be lost. By the use of a stand all requirements are kept in a convenient position.

Scions can be kept covered with a damp sack or cloth placed on the bottom of the tray and folded over to prevent exposure. Moist sphagnum moss can be placed in the bottom of a compartment to hold a few scions ready cut to the desired length.

Compartments can be made to suit individual requirements, but one side should be left full length to hold bud wood or scions. The dimensions of the stand illustrated are: Height 22in., length 21in., width 15in., depth of tray 3in., height of handle above tray 6in. The stand may be conveniently stored between seasons.

Heading photograph by R. W. Orr.

Management of Perching Pullets

HOUSEHOLD poultry keepers commonly buy perching pullets either to establish a small unit of laying birds or to replace birds that have completed their economic laying life. Management and feeding of perching pullets are comparatively simple, but a few precautions should be taken. This article by the Animal Industry Division of the Department of Agriculture describes the handling of pullets after they are through the brooding stage and up to the time they begin to lay.

THE term "perching pullet", commonly used in the poultry industry, refers to a young growing pullet approximately 8 to 10 weeks of age, a bird which has been hardened off from the heat given during the brooding stage and has acquired the habit of perching. Generally this is a handy age at which the householder can take over growing pullets, as it is the age at which the fully feathered, hardened-off pullet can be purchased with the least initial outlay. As they increase in age the price rises to cover the added cost of their maintenance incurred by the producer. Pullets are sold at less than 8 weeks of age, but generally householders are advised to choose the slightly more mature perching pullet.

These young growing pullets on free range are developing body size and sound constitution.

Separate Houses for Pullets

It cannot be emphasised too strongly that perching pullets, or indeed any growing pullets up to the laying stage, should not be put in a house or poultry run with fully grown birds. The latter will bully the young, growing birds, chase them from the food trough, and generally make life intolerable for them. This will result in stunted and timid pullets which will be unlikely to give satisfactory egg production later. Therefore a separate house or house and run are necessary for these young birds. Though it may not be practicable for many householders to give growing pullets a good grass run, birds up to 4 to 5 months of age benefit considerably by having access to a grass run of good dimensions. It is sound management in commercial practice to give growing pullets free range over a grass paddock, as this ensures that the birds develop good body size and a strong constitution, capable of standing up to heavy egg production later.

Perching pullets may, however, be allowed to grow up in a well-lighted and ventilated laying shed, provided they have ample room. They should be bedded down with ample clean litter such as straw and be encouraged to keep the litter turned over by scratching. Perching space of 6 to 9in. per bird is desirable. Perches of 3in. x 2in. or 4in. x 2in. timber should be used, the broad side being placed for the birds to sit on to prevent dented and crooked breast bones. It is an advantage to remove the sharp edges of perches.

Importance of Proper Perching

Although the birds when purchased may be termed perching pullets, the householder is advised to watch them for the first few nights to make sure they do perch. They should not be allowed to sit together in corners of the house or, indeed, to remain on the floor. Birds easily form bad habits which are difficult to break; therefore, they should not be allowed to form the habit at the start of perching on any part of the house other than the perches. Where necessary a little patience and perseverance during the first few nights after the birds' arrival will be well repaid.

Reminders for September

As the spring egg flush season has begun, all birds should be in production. Those not laying should be disposed of as uneconomic.

September is the start of the season for preserving eggs for use in winter. As the eggs should be infertile, male birds should not be run with the laying birds. Fertile eggs when preserved may deteriorate or break down owing to the presence of the live germ in the egg.

Broody hens should not be allowed to rob the egg basket, but should be put in a broody coop as soon as their condition is observed and fed well.

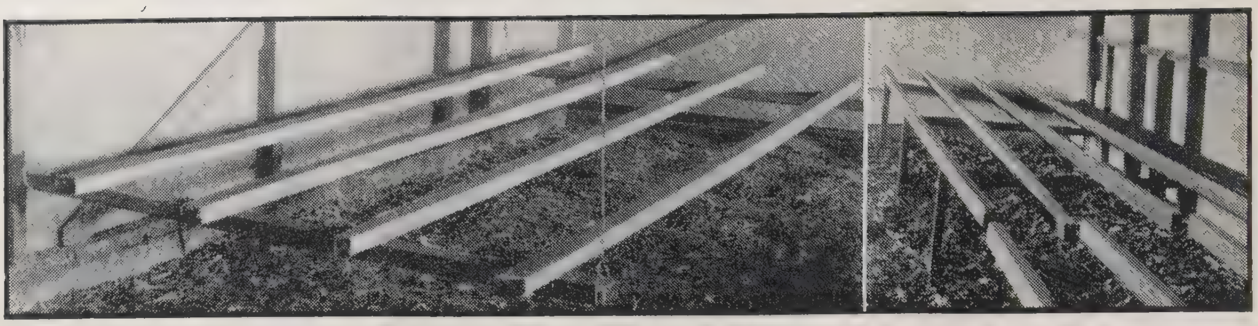
The nest boxes may contain a number of eggs when birds are in full production. The boxes should contain ample clean litter and precautions should be taken to prevent eggs being broken in the nests. It should be remembered that broken eggs lead to egg eating—a bad habit difficult to break.

Control of Internal Parasites

Young poultry are subject to internal parasites such as roundworms. These live in the intestines of the birds and at the expense of their proper nourishment. If many worms are present, the pullets become thin and unthrifty, but even if they are present only in small numbers, the worms are detrimental to the health and proper development of the birds. It is not easy to determine whether worms are present in small or moderate numbers. Therefore as a safeguard each pullet should be given a 1 c.c. capsule of carbon tetrachloride, which will clean the worms and their eggs out of the body. Dosing with capsules is simply done by placing a capsule at the back of each bird's mouth or in the throat and gently working down the top of the gullet with the finger and thumb on the outside of the top of the neck.

Feeding

Growing pullets require grain and mash, the latter being fed either as wet or dry mash. If it is available, standard chick mash No. 2 should be used or, if the chick mash is unavailable, standard laying mash No. 2. These mashes are not complete when purchased, as they contain no meat meal or protein supplement. Growing pullets need meat meal and benefit



[Photo at left by Fraser Niederer.

Two methods of setting up perches suitable for young growing pullets. The perches on the left, with the broad sides up for the birds to perch on, are superior to those on the right.

also from skimmed milk or buttermilk powder, but they do not require as much protein as birds in lay, and for this reason the recommendation is made to buy either chick mash No. 2 or laying mash No. 2 and to add the protein supplement at home. From 8 weeks of age to 4 months the birds should be fed chick mash No. 2 to which has been added ½lb. of meat meal and ½lb. of milk powder for every 10lb. of mash. If milk powder is difficult to obtain or is considered too costly, ¾lb. of meat meal should be added to each 10lb. of mash. From 4 months to laying stage ½lb. of meat meal should be added to each 10lb. of mash, but as soon as the birds start to redden up in the comb and face as they approach the laying stage a change should be made to standard laying mash No. 1, which contains 10 per cent. of meat meal.

For the first month after arrival, that is, from the age of 8 or 10 weeks to approximately 14 weeks, the young pullets will benefit from two mash feeds daily, in the early morning and midday, with a good grain feed late in the day. Thereafter they should be fed one wet mash and two grain feeds daily. An ample daily supply of fresh, clean water is essential, and a small box of medium metal grit should always be available. This is particularly necessary when birds are confined to a house and have no opportunity of picking up stones out in a run.

Green Food Essential

Growing pullets, like laying pullets, require a good supply daily of fresh, succulent green food, from which they obtain vitamin A, essential to their health and good development. Where green feed is in short supply or is of poor quality householders are advised to add fish oil (2000 units of vitamin A) to the mash, rubbing in approximately 2½ to 3 tablespoons to every 10lb. of mash.

For the grain feed a mixture of wheat, barley, and oats may be used in the proportions by weight of 2 : 1 : 1. Only good, plump oats are worth feeding, and if these are not available, equal proportions by weight of wheat and barley will be quite satisfactory.

Management and feeding are similar for all breeds, but light breeds such as White Leghorns may be expected to develop and come into lay at an earlier date than heavy breeds such as Australorps or Rhode Island Reds. First-cross pullets from matings between Australorps and White Leghorns, often referred to as Austral Whites, develop at a rate approximately between that of the light and heavy breeds.

Emphasis is laid on the necessity for ordering perching pullets at the beginning of the breeding season, say July or August, for delivery in November, December, or January. A householder who is in doubt as to a source of supply of pullets may procure the annual list of poultry producers who have accredited breeding flocks under the New Zealand Poultry Flock Improvement Plan from the Department of Agriculture, P.O. Box 2298, Wellington.

Pedigree Sow Records

Contributed by the Animal Industry Division

In the period January 1952 to June 1952 the following breeders had litters recorded as shown:—

Owner's name and address	Herd book number		Number of pigs		Litter weight		Grade of litter*
	Sow	Sire	Born	Weaned	3 weeks lb.	8 weeks lb.	
Large White							
Harper, R. J., Ohinewai	6343	9874	8	6	86	276	4
I'Anson, F., and Farrelly, B., Whakatane	9619	9080	16	10	129	374	1
Knight, M. H., Levin	9237	7955	14	9	116	426	2
Mundy, R. S., Whakatane	10210	9934	12	10	133	456	1
New Plymouth High School	9700	9687	12	12	152	453	1
Wood, A. E., Whakatane	9267	9873	15	12	164	486	1
Berkshire							
Pohangina Pig Club, Ashhurst	24968	25218	9	4	46	159	—

Minimum Litter Weight for Grades

Grade*	3 weeks (lb.)	8 weeks (lb.)
1	120	360
2	100	300
3	90	270
4	80	240
5	70	210

Breed Averages for the Period

Breed	Number of litters recorded	Number of pigs		Litter weights		Weight per pig	
		Born	Weaned	3 weeks lb.	8 weeks lb.	3 weeks lb.	8 weeks lb.
Large White ..	6	12.8	9.8	130	411.8	13.22	41.88

* A No. 3 grade is classed as good, No. 2 as excellent, and No. 1 as special.

Recent Research Work

WHEAT

DATA which provide a measure of yield differences resulting from various rotational practices and of fertiliser responses have been given by research work conducted in Canterbury by the Extension Division of the Department of Agriculture. Results given on this page place yield figures on the value for wheat of nitrogen provided either by a preceding leguminous crop or by nitrogenous fertilisers.

PLACE OF WHEAT IN ROTATIONS

A SURVEY in the Ashburton area showed that two-thirds of all wheat crops were taken after grass or a fed-off crop. Among other rotations wheat after peas yielded 3.1 bushels per acre more than average and the yield after another wheat crop was 2.9 bushels less than average.

In the Christchurch district the best yields were obtained after grass, 3.3 bushels per acre better than average, and the poorest were after wheat, 4.1 bushels below average. The yield difference was 3.2 bushels per acre in favour of rotations which placed the wheat crop within 2 years of grass over rotations where the field had been cropped for 2 years before wheat.

NITROGENOUS FERTILISERS

AN ANALYSIS has been made of 196 wheat trials conducted by the Division which included a spring topdressing of either sulphate of ammonia or nitrate of soda. These trials were begun in the 1926-27 season and since then no general change in the level of nitrogen responses has occurred, though in some periods responses were greater than in others. Therefore this factor was removed in the analysis, and in the process any differences between the effects of nitrate of soda and sulphate of ammonia were removed, as nitrate of soda was used only in the first few years of trials. Similarly, the effect of different wheat varieties was removed, most trials before 1937 being sown with Solid Straw Tuscan and most of those after 1937 with Cross 7.

The analysis considered the factors which seemed to have the greatest effect on nitrogen responses—year of trial, district, previous crop, soil type, time of application of nitrogen, and yield of crop. The mean response to nitrogen over the 196 trials was 2.8 bushels per acre, and the greatest responses are to be expected when wheat follows a previous wheat crop, on "recent to young" alluvial soils, and from applications made in late September.

DISTRICT DIFFERENCES

AVERAGE RESPONSES to nitrogen in different districts were as follows, differences exceeding 1.4 bushels per acre being considered statistically significant:—

District	Average response to nitrogen (bushels per acre)	Number of trials
North Canterbury	1.2	38
Christchurch	2.9	38
Ashburton	2.2	40
South Canterbury	5.2	39
North Otago	4.0	28
Others	Nil	13

These figures do not represent the actual mean nitrogen response in each district, but the mean response freed from the effect of other factors. The high responses in South Canterbury and North Otago are linked with the fact that many trials in these areas were grown under conditions associated with small responses to nitrogen, the two most common factors being "pan" soils and the placing of wheat after grass in the rotation. Correcting for these factors results in high mean nitrogen responses in South Canterbury and North Otago.

PRIOR CROPS

MARKED DIFFERENCES between nitrogen responses were found when the trials were grouped according to the crop in the ground the season before the wheat of the trial was sown:—

Rotation	Mean response (bushels per acre)	Number of trials
Wheat after grass	0.6	58
Wheat after wheat	5.5	51
Wheat after rape or chou moellier	2.2	32
Wheat after other crops ..	2.9	55

Differences of more than 1.1 bushels are statistically significant. The outstanding feature is the large response to nitrogen when wheat follows wheat and the small response when wheat follows grass. The difference between these two items is highly significant.

EFFECT OF TIME OF APPLICATION

ANALYSIS showed clearly that the extent of the response was associated with the time the nitrogen was applied. The "response curve" rose from zero (no response) to mid-August applications to a maximum of 4.7 bushels per acre response to applications on 26 September and then declined to reach zero again on 7 November. It is clear that nitrogen can be applied too early or too late in spring and that the best time in most years is late September.

—*P. B. LYNCH and J. G. MILLER*

* * *

NEW WHEAT VARIETIES

TRIALS incorporating new varieties of wheat bred by the Crop Research Division, Department of Scientific and Industrial Research, continue to form a large proportion of the experimental work in arable districts. In the 1951-52 season 43 replicated variety and manurial trials were carried out.

Some new crosses from the Crop Research Division have given very promising results in recent years. Cross 7 is used as a standard variety in trials and, whereas a few years ago it was usually one of the highest-yielding varieties, in the past few years it has been usually one of the lowest-yielding.

Extensive testing of these new crosses is necessary before their release to farmers. Such new material must be satisfactory in milling and baking quality as well as high yielding and must have desirable agronomic characters such as strength of straw, resistance to "shaking", and all the factors that go to make a good "heading" wheat. There is reason to hope that one or more new varieties, as desirable as Cross 7 to the grower but considerably higher yielding, may be available for distribution to farmers in a few years' time.

—*P. B. LYNCH*

NEW ELASTRATOR Automatic ring loader SPEEDS DOCKING

Now you can dock lambs easier, faster . . . without awkward fumbling. With Elastrator's automatic ring loader your left hand is free to hold the lamb firmly, and a single movement with your right hand automatically loads the Elastrator, one ring at a time, from the supply box of 500 rings.

SAVES TIME

The rings are automatically fed to three self-charging feeder slots from which each ring can be simply and quickly engaged on the prongs of the Elastrator.

SAVES RINGS

You can't spill rings or knock over the box. Elastrator's new Ring Loader eliminates risk of contamination from yards.

ORDER NOW

Available from your Stock and Station Agent or direct from

ELASTRATOR
COMPANY LIMITED,
Box 226, Blenheim.

Recognised as the best . . .

Whichever way the land lies **Wolseley fencing** is supreme always. To-day's food problems demand the best use of grassland. Strip grazing pasture allows more cows per acre, fresh, clean feed daily, higher milk yield. The **Wolseley Electric Fencer** is simply and easily erected—ideal for strip grazing.

whichever way the land lies

WOLSELEY

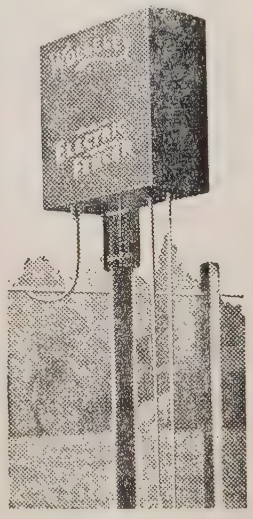
ELECTRIC FENCER

A British Product — 5 Years' Guarantee.

Price £10 8s. 6d. net (including 4 corner and 50 post insulators)

Enquire from—

DALGETY & CO. LTD. All Branches.



Safest FOR ALL STOCK

Three times more powerful, germicidally, than pure carbolic acid. Dettol, as supplied to the Royal Veterinary College, London, has many advantages. Use Dettol for the cleansing of wounds; as a lotion in suppurative conditions; for vaginal irrigation; for the routine disinfection of udders; for sore and cracked teats. Dettol is gentle and safe on the tenderest tissues, and most agreeable to use.

'DETTOL'

THE MODERN ANTISEPTIC

Obtainable in one gallon tins from your Chemist, Veterinary Club, or Stock and Station Agent.

Reckitt & Colman (New Zealand) Ltd., Pharmaceutical Division, Bond Street, Dunedin.

Responsibilities of Beekeepers

IN countries such as New Zealand which depend on agricultural, pastoral, and horticultural products for the greater part of their exportable surplus, honey bees are important in the maintenance of a sound national economy. In addition to their production of honey for food and commercial beeswax, which is valuable in the manufacture of insulating and other compounds, honey bees are the only pollinating insects which can be controlled in sufficient measure to provide a nation-wide service of pollination and consequent regeneration of economic plants, particularly pasture species and fruiting trees and shrubs. The continued economic existence of beekeeping in this country is dependent on the effective control of destructive bee diseases, and legislation designed to this end has been in existence for many years.

IN this article D. Roberts, Apiary Instructor, Department of Agriculture, Auckland, summarises the main responsibilities of beekeepers under the Regulations embodied in the Apiaries Act 1927 and its subsequent amendments.

Valuable Pollination Service

Introduced into this country little more than a century ago, honey bees have, particularly in latter years, played an important role in the maintenance of pastures and production of essential foods. The value of their services in this connection cannot be fully defined, but investigation in overseas countries with similar agricultural economies has shown that the value of the pollination services rendered by honey bees is many times greater than the worth of the honey and beeswax produced. Following on research into this question recognition of the value of the honey bee as a pollinator is now becoming widespread, particularly in the United States of America, where a substantial business devoted to the supply of bees for this purpose only has arisen.

Best Adapted of the Insects as Pollinator

The honey bee represents the highest development as a flower pollinator attained by any member of the insect world, and of all the insects that depend on flowers for their existence they are the best adapted by bodily structure to act as carriers of pollen. The complete dependence of the honey bee on the two plant products pollen and nectar for its existence both in the larval and adult stage, together with its habit of frequenting only one species of plant at a time, makes it a much more effective pollinator than insects which visit all flowers promiscuously.

Introduction of Protective Legislation

Like other creatures, bees are subject to certain infectious and destructive diseases, and after widespread outbreaks of foul-brood disease (*Bacillus larvae*) which about 50 years ago threatened the existence of beekeeping in New Zealand, it became evident that survival of the industry could be accomplished only by the introduction of protective legislation.

Introduced in 1907, the Apiaries Act was amended in 1913 and again in 1920 and was subsequently re-enacted in 1927 in a form designed to provide the maximum of service and protection to beekeepers and to ensure as far as possible the economic production of honey and beeswax and the continuation of an adequate national pollination service. To ensure the effective continuance of this protection and service to the industry strict adherence to Regulations under the Act is necessary, and it is the duty of every beekeeper to become thoroughly familiar with these Regulations as they apply to the individual.

The Act is administered by the Department of Agriculture, which maintains a staff of Apiary Instructors, whose duties include administration of the Regulations for control of bee diseases and the giving of instruction on care and management of apiaries, honey houses, and honey-house equipment.

The existence of beekeeping in New Zealand depends on the maintenance of efficient disease control and this is possible only with the full co-operation of all beekeepers. Because the Apiaries Act, like many others on the Statute Book, is not being continually publicised, there is a tendency for many apiarists to fail to observe its requirements fully.

[*Rendell's Photo Service photo.*

Standard movable-frame hive, which enables manipulation and examination of bees and brood combs to be carried out.

Registration of Apiaries

All apiaries, whether of one hive or more, must be registered under the Apiaries Act, and it is the responsibility of individual beekeepers to make application for registration of their apiaries. Application forms may be obtained from any office of the Department of Agriculture. Application cards (forms) are already addressed and may be posted loose without stamps. There is no charge for registration.

When a change takes place in the ownership of an apiary for which a certificate of registration has been issued or where an apiary is removed or is closed for any reason the Registrar of Apiaries, Department of Agriculture, should be notified and the registration certificate returned for cancellation. Any new owner must make application for registration of the apiary in his own name immediately.

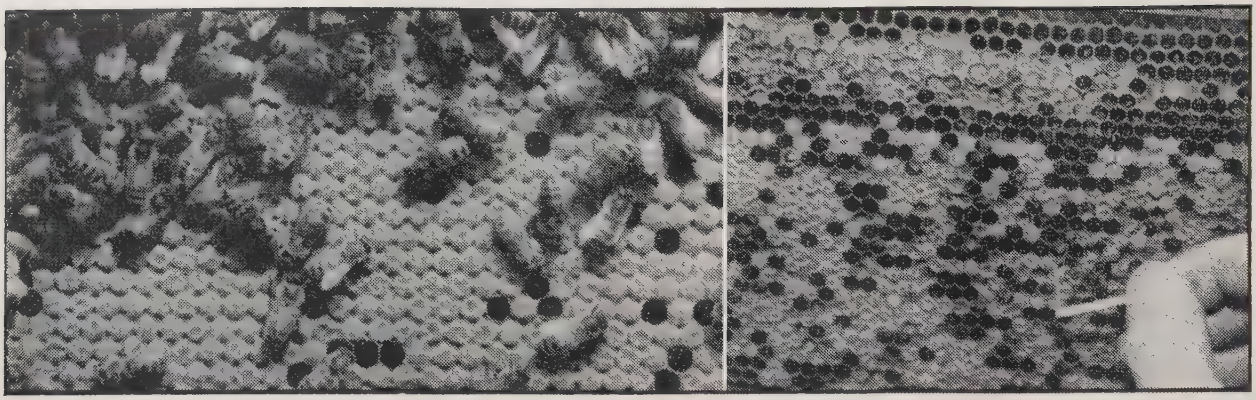
Compulsory registration is necessary for statistical purposes and so that apiaries may be found readily for periodical inspection for control of bee diseases.

To enable the apiary register to be kept up-to-date beekeepers are required to notify the Registrar of Apiaries in May (previously June) each year of any increase or decrease in the number of hives kept at each apiary if there is a change in the number of more than 5 hives.

Any person keeping unregistered hives or allowing them to be kept on his land is liable to a fine of £20.

Sale or Removal of Bees

A permit for the sale or removal of hives to a new location must be obtained from the Apiary Instructor for the district. The object of this regulation is to prevent the transfer of diseased bees or infected hive material to the



[*Photo at right by Sparrow Industrial Pictures Ltd.*

Left—Bee comb and healthy and contented bees. Right—Comb showing diseased brood and ropy nature of dead brood when probed with match.

neighbourhood of clean apiaries. It is the responsibility of the owner of the bees to obtain the necessary permit. Failure to do so renders the beekeeper liable on conviction to a fine of up to £25.

A beekeeper may remove any bees, bee combs, or apiary appliances from any of his registered apiaries to another for the purpose of apiary management or extraction of honey, provided his apiaries are free from disease.

Movable-frame Hives

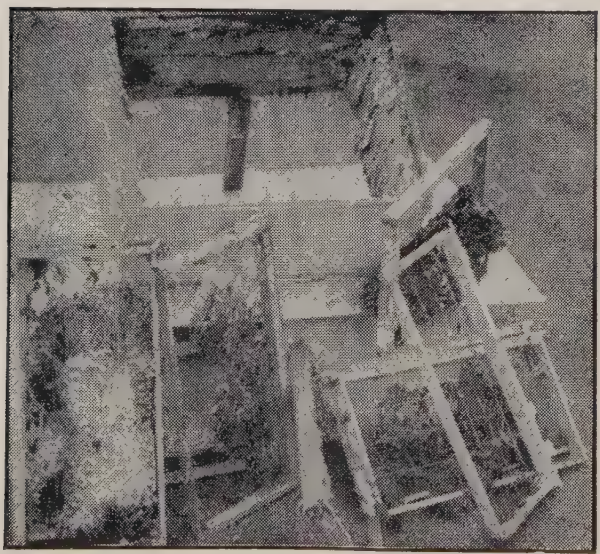
Keeping bees in ordinary box hives is a breach of the law. Bees must be kept in hives fitted with movable frames so that an examination of the brood and bees may be made at any time, for colony management, and for control of diseases. Where bees are not provided with movable frames fitted with full sheets of foundation wax the bees may so build the combs that it is impossible to manipulate and inspect the interior of a hive.

The condition of a colony of bees cannot be judged merely by looking at the entrance to a hive or at the top and bottom of the combs only.

Bees in Walls of Buildings

Bees established in the walls or other parts of buildings are not under proper control, they cannot be inspected for disease, and they provide a means by which foul-brood may be spread to apiaries properly established in frame hives. The Apiaries Act gives power to an inspector to take proceedings against any person who refuses to remove or allow to be removed any bees or bee combs established in buildings owned or occupied by him. If the property owner is unable to do the work himself, the local Apiary Instructor of the Department of Agriculture will usually be able to provide the names and addresses of persons who are willing to undertake the work.

Any bees that have become established in trees or other irregular shelters must be transferred to a movable-frame hive or destroyed, and it is the responsibility of the property owner to see that this is done.



Bee combs destroyed by greater wax moth.

Diseased Bees

Experience has shown that the shaking or McEvoy method of treatment to clear foul-brood from infected apiaries has not been successful in eradicating the trouble and that in most cases where foul-brood tends to recur this may be attributed to the handling of bees and equipment removed from infected hives. Consequently, beekeepers are now required to destroy the contents of diseased hives found by inspectors and to sterilise thoroughly any remaining hive equipment by approved methods within a specified time.

Diseased bees must not be sold or disposed of in any way other than destruction by fire. Neglect of these precautions can involve neighbouring beekeepers in much trouble and expense and cause widespread outbreaks of foul-brood, which may take years to eradicate.

Diseases and Pests Listed

Most beekeepers are aware that brood diseases of bees and several pests exist in New Zealand, but in many cases it is assumed that use of the term "disease" is applied only when American foul-brood is under discussion. This assumption is incorrect, as several other diseases and pests are included in the definition of disease as set out in the Apiaries Act, as follows:—

European foul-brood (*Bacillus pluton*), Isle of Wight disease (acarine disease), *Nosema apis*, the greater wax moth (*Galleria mellonella*), the lesser wax moth (*Achroea grissella*), and the bee louse (*Braula coeca*).

Fortunately for beekeeping in New Zealand, acarine disease, the most devastating of all adult-bee diseases, is not present in New Zealand.

Notification of Disease

Every beekeeper in whose apiary disease appears is required to take immediate and proper steps to prevent its spread and should also notify the Apiary Instructor for the district of its presence within 7 days of the appearance of the disease.

Full particulars of methods for painless killing of diseased bees before burning and details of methods to treat the various diseases and pests of honey bees found in New Zealand may be obtained from the local Apiary Instructor of the Department of Agriculture.

Selection of Dairy Herd Replacements

By G. R. MACKINTOSH, Inspector of Stock, Department of Agriculture, Hamilton

ONE of the most important aspects of the dairy industry is the maintenance of quality in herds by suitable replacements. Obviously the only way the farmer can do this is to breed his own replacements or to purchase the necessary heifers or cows. On some farms the only stock purchased are bulls, with which the owner hopes to be able to maintain or improve the production of his herd. On the other hand thousands of well-established farmers yearly purchase heifers at saleyards or elsewhere. It is also practice for those beginning dairying, whether as 50/50 sharemilkers or as farmers on their own account, similarly to buy their milking stock. These potential milk producers may be bought as advanced weaner calves, as yearlings, as in-calf heifers, or as adult cows.

[*"New Zealand Dairy Exporter" photo.*

Dark-fawn Jersey with excellent conformation and high milk-producing qualities.

IN the main dairying districts of New Zealand the most popular breed by far is the Jersey, which may be broken coloured, a light fawn, or a dark fawn.

Cattle of a high milk-producing or butterfat strain, with well-grown frames, good conformation, and healthy robustness, are universally accepted as potentially high producers. Few farmers, if any, would suggest that colour in the Jersey breed has any value as an indication of good butterfat-producing capabilities, yet over recent years light- or brown-fawn heifers almost invariably have commanded substantially higher prices than their dark or broken-coloured sisters who possess the same propensities for production. A difference of £2 to £3 per head is quite normal. It is not uncommon in Waikato saleyards for a pen of light-fawn yearlings to bring as much as £4 and even £5 a head more than is paid for an adjoining pen of equally well-bred, well-grown, and well-conditioned dark Jersey heifers of the same age.

Because the shrewd, experienced dealer is well aware of the decided preference buyers have for a particular colour, it can be readily understood why he shows a liking for fawn dairy cattle. He is principally interested in their resale and not their productive capacity or hardiness.

Why do farmers, sharemilkers, and some Government officers, when purchasing young Jersey stock, apparently follow this fashion? When purchasers are asked why higher prices are paid for light fawns in preference to broken-coloured or dark Jerseys, no sound reason is given. Some like the colour and others say that light fawns are prettier animals or that a herd of that colour is good to look at.

The desire to own a herd all of a bright, light colour, pleasing to the eye, with the appearance of evenness of type and uniformity is widespread. A herd gathered or purchased with this idea is not necessarily high producing or hardy. The tendency to buy pretty cattle may mean building up a herd with less productive capacity and constitution than could have been obtained by buying those of the best strains and conformation. It certainly does not justify the additional expenditure of, say, £300 when purchasing 100 to 120 heifers.

A prominent Waikato dealer commented that he had frequently been

Two pens of yearling heifers, one light fawn and the other dark fawn.

asked where he had obtained certain dark Jerseys which he had resold in previous seasons. The purchaser had found them so good that he desired more animals of similar quality. This does not mean that the dark Jersey cattle are better than the popular fawns. The explanation is probably that these dark heifers were reared by a farmer with a view to keeping them if the season permitted. Almost certainly they were from his top cows by good bulls as well as being of good conformation. Two of the best Jersey herds in New Zealand, well known for their outstandingly high butterfat average, have a greater percentage of dark cattle than is usual in Jersey herds.

A farmer, asked why he had placed a good-sized, well-shaped dark Jersey calf in the bobby calf pen while rearing some less attractive fawn ones, explained that he only reared a dozen calves for sale as weaners, and that although the dark bobby calf was from one of his best cows, it would not bring as much in the saleyards as a fawn calf. If this practice was widely adopted by farmers who rear heifers for sale it could have a harmful effect.

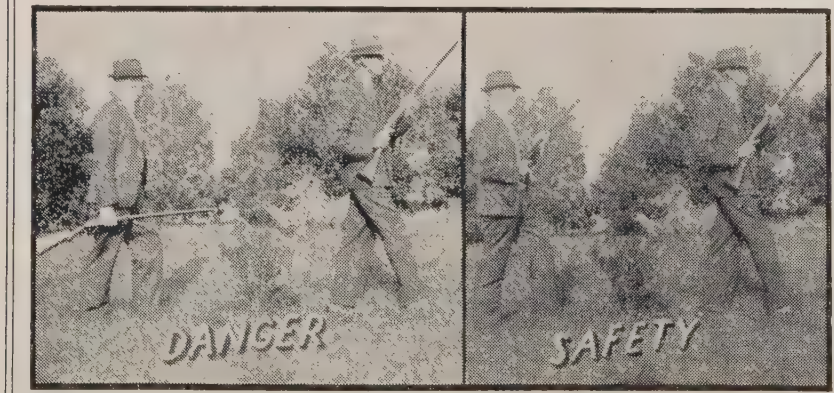
Not only in purchasing heifers is there a fashion in colour. A Waikato Jersey breeder, who breeds on the best lines for production, was amazed to hear the purchaser of one of his yearling bulls say that he had bought the bull because of its light colour.

The preference for light fawns is probably more noticeable in the calf or yearling stages. When Jerseys reach the selling ring as springers, colour, though not disregarded, is of less importance. If two animals were submitted of equal quality, one fawn and one dark, the fawn would unquestionably be preferred, but colour would not have been the chief consideration. Attention at this stage is given to milking possibilities and udder formation. No experienced purchaser would pass over a good dark springer in favour of a second-rate fawn.

Some years ago, when it was the practice to mark calves and issue certificates showing the dam's production many of the animals were other colours than fawn. Without the certificates, many of the lots could not have stood up to the competition offered by others classified for colour.

The main aim in dairying is maximum production, and farmers can contribute much toward greater efficiency by adopting a more realistic attitude when purchasing milking animals. They should seek first animals of a high-producing strain, of good dairy conformation and obvious health and vigour, and should disregard colour. A really good herd is not one of any particular shade or with all members possessing the same colour.

By criticism and free exchange of ideas farmers have gradually changed many of their views and different standards have been accepted. Those who have a long association with the industry can recall practices the eventual discarding of which has contributed to the industry's present high standard.



MANY shooting accidents occur through carelessness in carrying firearms. Wherever possible a firearm should be unloaded. When this is not possible every precaution should be taken to make sure that the weapon is not endangering another person.

A common example of such carelessness is shown in the illustration at left. The second man is holding his gun in such a way that if it accidentally discharged it could fatally injure the man in front. This method of carrying a weapon is especially dangerous if shooters have to pass through scrub or rough country. A loaded firearm is never under proper control unless it is held in both hands and inclined upward as shown at right. A weapon carried in this way is under control, though the hunter is ready for a flushed bird or running rabbit. The trigger finger should always be kept outside the trigger guard.

Always unload a firearm when it is not intended to use it immediately, and never allow a loaded firearm to point near another person.

—*G. G. KELLY*

Radio Broadcasts

RADIO broadcasts to farmers will be given as follows during September:—

1YA Auckland, 7.15 p.m.

3 September—"Spring-sown Crops in the Auckland Province", by H. Woodyear-Smith, Auckland.

10 September—"Apiary Management", by E. Smellie, Apiary Instructor, Department of Agriculture, Auckland.

17 September—"The Value of Soil Testing to the Instructor for Advisory Service", by J. R. Adams, Instructor in Agriculture, Department of Agriculture, Pukekohe.

24 September—Young Farmers' Clubs' session, conducted by Waikato district committee of the Federation of Young Farmers' Clubs.

1XH Hamilton, 12.33 p.m.

4 September—"Care of Young Stock during September", by P. J. McCann, Veterinarian, Department of Agriculture, Hamilton.

11 September—"Experimental Work in the Field", by H. M. Bull, Instructor in Agriculture, Department of Agriculture, Hamilton.

18 September—"Factors Likely to Affect the Future of the Dairy Industry", by W. T. Peterson, Dairy Section, Federated Farmers, Hamilton.

25 September—"Planting and Care of Young Fruit Trees", by C. E. K. Fuller, Horticultural Instructor, Department of Agriculture, Hamilton.

1YZ Rotorua, 7.15 p.m.

4 September—"Breeding Problems in Dairy Herds", by P. J. McCann, Veterinarian, Department of Agriculture, Hamilton.

18 September—Talk conducted by Rotorua district committee of Federation of Young Farmers' Clubs.

2YZ Napier, 7. p.m.

2 September—"Chicken Rearing", by H. K. Mullins, Poultry Instructor, Department of Agriculture, Hastings.

16 September—"Combating Farm Pests", by R. P. Hill, Fields Instructor, Department of Agriculture, Hastings.

30 September—"Wool-clip Preparation at Shearing Time", by R. G. Montgomery, Sheep and Wool Instructor, Department of Agriculture, Hastings.

2ZA Palmerston North, 12.30 p.m.

8 September—"Spring Treatment of Lawns", by E. A. Madden, Agrostologist, Department of Agriculture, Palmerston North.

15 September—"Disease Control in the Home Orchard", by B. P. Coleman, Horticultural Instructor, Department of Agriculture, Palmerston North.

22 September—"Quality Faults in Dairy Production and their Remedies", by M. J. McFetridge, Special Inspector, Department of Agriculture, Palmerston North.

29 September—Young Farmers' Clubs' session, conducted by I. G. Tabor.

3YA Christchurch

11 September (7.15 p.m.)—Review of "The New Zealand Journal of Agriculture", by E. G. Smith, Fields Instructor, Department of Agriculture, Rangiora.

22 September (12.20 p.m.)—"The Rural Sociologist and the Farm Home", by E. Unwin, Field Officer in Rural Sociology, Department of Agriculture, Christchurch.

29 September (12.20 p.m.)—Talk by chairman, Mid-Canterbury district committee of the Federation of Young Farmers' Clubs.

4YA Dunedin, 7.20 p.m.

9 September—"Brassica Seed Production", by J. O. Wallace, Seed Production Officer, Department of Agriculture, Dunedin.

24 September—"Simple Hints for Successful Poultry Farming", by W. G. Proudfoot, Poultry Instructor, Department of Agriculture, Dunedin.

Other Broadcasts

1YA Auckland, Tuesdays at 12.35 p.m. and Wednesdays at 7.15 p.m.; 1YD Auckland, Thursdays at 7.30 p.m.; 1XN Whangarei, Mondays and Wednesdays at 8.10 p.m.; 2XA Wanganui, Thursdays at 8 p.m.; 2XG Gisborne, Tuesdays at 8 p.m.; 3XC Timaru, Wednesdays at 8.5 p.m.

Shelter in Citrus Orchards

THERE are few orchardists who have not seen at one time or another the growth of fruit trees checked through lack of shelter. To develop and maintain strong-growing, well-balanced, and productive citrus trees, it is essential to protect them adequately. Storms accompanied by high winds, with resultant crop losses and damage to trees, are to some fruit growers far too frequent and costly experiences. In this article J. E. Hume, Horticultural Superintendent, Department of Agriculture, Palmerston North, and F. L. Bailey, Horticultural Instructor, Department of Agriculture, Tauranga, deal with various aspects of planting and maintaining protective shelter belts and the kinds suitable for citrus orchards.

AS citrus trees are evergreens, shelter that will protect the trees adequately the whole year is desirable. The leaves are the food-manufacturing organs of the tree, and to secure maximum growth and crop yields it is necessary that protection from winds should be afforded so that the growth and functions of the foliage are not restricted.

Inadequate shelter may cause stunting of trees and loss of crop, because of exposure to cold and/or drying winds; foliage becomes hard, brittle, and restricted in size and fruits are small, tough, and usually badly blemished with limb and leaf rub. The over-all life of the affected trees is likely to be substantially reduced and their susceptibility to attack by diseases increased considerably. Seldom is natural shelter sufficient to give satisfactory protection.

In general, the following three types of wind cause injury to citrus trees:—

Prevailing winds of low velocity: Prevailing winds are experienced in nearly all fruit growing districts and frequently they cause slight injury and distortion to the foliage on the exposed sides of citrus trees. At certain periods of the year they may blow so continuously that trees, particularly young trees, planted in poorly sheltered areas develop a lop-sided appearance. That feature is undesirable, because it is difficult to restore their symmetry unless they are pruned severely.

Coastal winds: The velocity of coastal winds usually is not great. They are also infrequent and their effect is noticeable only in citrus orchards established on areas very close to the sea. When they do occur, however, they are usually salt laden and are accompanied by fairly high temperatures. Neither feature is desirable, as there is a possibility of an adverse effect on general tree growth and a chance of fruit set being reduced if the winds occur at blossoming periods.

Periodical winds of high velocity: Winds of gale force are not confined to any particular season. They may damage trees severely, causing major breakages of limbs, and sometimes fruit is torn off. Where fruit is not torn off its grade often is lowered and it either becomes useless for marketing or its marketable value is reduced because of branch rub or other mechanical damage.

Upper left—Tall shelter provided by *Pinus radiata* with low subdividing shelter in a young orchard. Above—Young hedge of *Hakea saligna* being developed for subdivisional shelter. Lower left—Hedge of *Chamaecyparis lawsoniana*.

By the planting of protective shelter trees the undesirable effects of prevailing and coastal winds can be almost eliminated and damage caused by winds of high velocity can be reduced to an extent where it is of little economic importance. During dry spells loss of moisture from an orchard by evaporation and transpiration has a marked effect on tree vigour and crop yields. A well-sheltered orchard has an added advantage in that the drying power of wind is reduced. That is an important feature, particularly in citrus growing areas where supplies of water for irrigation are either limited or unavailable.

Planning of Shelter

Careful thought should be given to planning shelter for an area and consideration should be given to the following:—

1. Location of the site or area in relation to prevailing winds.

2. Topography and size of the area to be sheltered.

3. Type, extent, and location of shelter belts already planted in the vicinity.

On comparatively flat land it is estimated that each 1ft. in height of dense shelter at right angles to the prevailing wind will adequately protect a distance up to 5ft. from the shelter and probably give reasonable protection to a further

WHY NOT BE SURE OF THE MOISTURE CONTENT OF YOUR GRAIN WHEN HARVESTING OR STORING?

Accurate Answers in two to three minutes by a single non-electric **"MOISTURE TESTER"**

AVAILABLE IN 6 RANGES FROM STOCK TO MEET SPECIFIC TRADE REQUIREMENTS

Fertilizer Manufacturers
Flour Millers
Foodstuff Manufacturers
Founders
Brewers
Paint Manufacturers
Horticulturists
Barley Millers
Biscuit Manufacturers
Textile Manufacturers
Brick and Tile Manufacturers

6,500 ALREADY IN USE THROUGHOUT THE WORLD

Moisture Content:

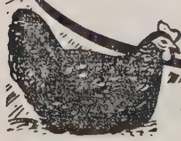
O — 5% O — 10%
O — 18% O — 20%
O — 25% O — 50%

For full particulars of the **SPEEDY Moisture Tester** write:—

CORY-WRIGHT & SALMON LTD

AUCKLAND :: WELLINGTON :: DUNEDIN

DAWE'S FUMIGATING NEST EGG



U.S.A. POULTRY FARMER'S INGENIOUS DISCOVERY

Hens Lay Better When Comfortable

Ingenious American discovery for poultry health and comfort and encourages better laying—now made by special arrangement in New Zealand. Banishes fleas, lice, vermin, etc. in the nest and on the hen—no fussing with disinfectants. Each egg lasts for months—practically unbreakable. The more the hen sits on the egg the more effective the action.
Money returned after 7 days if not satisfied. "They're wonderful," says leading Auckland poultry man. Protect your flock this proved, labour-saving way.

POST COUPON TODAY

VANEX (N.Z.) LTD.,
287 Cuba Street, Wellington.

Please send me .... only Dawe's Patent Nest Eggs.

I enclose ....

NAME ....

ADDRESS ....

Sold Only on Money Back Guarantee.

AVOID NUTRITIONAL SCOURING

The vitamins in CALF EMULSION replace the butterfat vitamins, the absence of which often leads to scouring. Vite-ADee Calf Emulsion mixes **right through** the skim or whey and your calves find it so palatable that, quite literally, they lick it up to the last drop.

Ask your Merchant for

Vite-ADee Calf Emulsion

Above—Hedge of *Albizzia lopantha* 10 months from sowing. Right—Tall shelter provided by Lombardy poplar with barberry for low shelter.

[*Rendell's Photo Service photo.*

5ft. Thus 5 chains of shelter 20ft. high should give fair protection to approximately 1½ acres of orchard on the flat. If the land slopes away from the hedge on the sheltered side, the protected area is likely to be greater, and the reverse applies if the shelter is on the lower side of the sloping land.

If there is tall shelter near the orchard area, it is possible that only secondary shelter of medium height will be required. The density of shelter, as well as the height, must be taken into consideration. A compact shelter all round an orchard tends to create a pocket where there is hardly any air circulation. In summer this lack of air movement is likely to cause scalding of fruit, foliage, and young shoots, and in winter there would be a likelihood of frost settling within the area. A more open hedge on one side would allow for improved air circulation; this should be on the leeward side of the prevailing wind and where possible on the lower side of the block to allow for air drainage.

Distance between Shelter Belts

Because land contours vary, it is not possible to stipulate exactly how far apart shelter belts should be planted. With rolling or undulating land where there are areas suitable for citrus growing some natural shelter is provided and requirements will differ from those on tracts of flat or gently sloping land, which are more exposed to winds. Undulating country tends to break up wind, and the use of high-growing shelter belts usually is not as essential as on flatter, more exposed areas.

Under most circumstances it is necessary to plant high shelter surrounding about every 10 acres of citrus orchard to provide reasonable protection from winds. The southern and western boundaries usually need greatest protection, and in some districts, according to local conditions, it may be possible to modify shelter requirements on eastern and northern boundaries. On the more exposed boundaries the planting of high shelter trees in conjunction with lower-growing but denser trees is desirable to reduce possible ill effects to growth caused by ground draughts.

An area of 10 acres requires subdivisional as well as boundary shelter. Normally such an area is best subdivided into blocks of about 2 acres and shelter planted to divide each block. Shelter trees selected for that purpose should be of the lower-growing types and after planting should be kept well trimmed.

Frequently too little attention is given to the selection of the type of shelter to be planted around a citrus orchard. The area to be sheltered should be studied and the kinds and type of shelter required decided upon, care being taken that they are suitable for the district. Horticultural officers can advise on suitable types for a locality and give details of methods of propagation of hedge and shelter trees.

Suitable Shelter Trees

Shelter trees for citrus orchards may be of temporary or permanent types.

Temporary Shelter

Temporary shelter consists of rapid-growing, short-lived species which give fairly good protection from winds within 18 months to 2 years from planting. Such temporary shelter, because of its rapid growth, provides effective shelter for newly planted orchards. If kept trimmed, these temporary species will last from 8 to 10 years, but when permanent shelter becomes of sufficient height and density to protect the orchard temporary hedges should be removed.

Species: Temporary shelter can be provided by growing *Albizzia lopantha* (Benth.) (brush wattle) or *Cytisus proliferus* (Linn.) (tree lucerne). *Albizzia lopantha* is preferable. Both can be seeded about October in the permanent positions. They should be trimmed frequently. *Albizzia lopantha* is usually the more vigorous and may reach a height of 12ft. within 2 years; it is somewhat frost tender, particularly in the seedling stage. A fault with tree lucerne is that odd plants in the hedge line tend to die, leaving gaps that create a serious draught, which is often more detrimental to citrus and sub-tropical trees than no shelter.

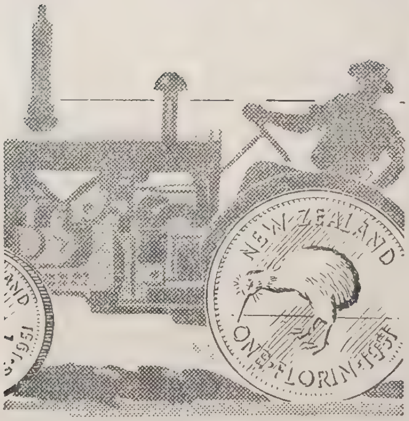
Germination of the seed will be improved by the following treatment: Place the seed in a tin, pour boiling water over it, allow it to stand overnight, and wash it next day in 2 or 3 changes of cold water and spread it out to dry for about an hour before planting.

Permanent Shelter

For permanent shelter there are a number of varieties of trees from which a suitable selection may be made. The varieties chosen should be adapted to local conditions, long-lived, and, if possible, not hosts for insect pests or diseases attacking citrus. If circumstances permit, permanent shelter should be established at least 2 years before citrus trees are set out.

High shelter: Trees suitable for providing boundary shelter in exposed areas are *Pinus radiata* (Don.), *Eucalyptus macarthuri* (Deane and Maiden), and *Populus nigra* var. *italica* (Du Roi) (Lombardy poplar). *Pinus radiata* and *Eucalyptus macarthuri* do well in the citrus areas and stand periodical cutting back, if they overhang or get too tall. Although both tend to rob the soil for a considerable distance from the shelter line, little trouble should be experienced if citrus trees are at least 30ft. back from the shelter belt.

Keep Your Capital



Working

Your capital is seldom powerless to work for you if it is invested in a sturdy British diesel-engined vehicle—fitted with C.A.V. fuel injection equipment.

But for maximum power output, with the greatest fuel economy, it will pay you to have your C.A.V. equipment checked over regularly by a factory-trained specialist.

Your nearest C.A.V. Service Agent is listed below.

C.A.V.

Fuel Injection Equipment keeps on with the job

Joseph Lucas (N.Z.) Ltd.,
75-77 Beach Rd., AUCKLAND.
Unity Buildings, HAMILTON.
Grey Street, TAURANGA.
Civic Buildings, WHAKATANE.
Whangarei Engineering Co., WHANGAREI.
L. M. Silver & Co. Ltd.,
Jervois Quay, WELLINGTON.
King Street, PALMERSTON NORTH.
263 Victoria Avenue, WANGANUI.
Wooff & Salvesen Ltd.,
17-19 Lichfield St., CHRISTCHURCH.
Wooff & Salvesen (Dunedin) Ltd.,
260 Cumberland St., DUNEDIN.
Giles & Duncan, 52 Theodocia St., TIMARU.
Ross Mitchell Ltd., Don St., INVERCARGILL.

Always Comfortable

You can work for hours under all conditions in your Marathon Gumboots. They always give complete protection . . . they're always comfortable.

MARATHON GUMBOOTS

Made by MARATHON RUBBER FOOTWEAR LTD.,
A Manufacturing Division of Skellerup Industries Ltd., Christchurch.

CASE TRACTORS
KEEP ON WORKING **30,000 HOURS**

4875.9

Few farm tractors are used a thousand hours a year. Some of the seven Case tractors shown above have worked over 30,000 hours and are still going strong. All seven are owned by the Kronk family of Darling Downs, Australia. The Kronk men were so pleased with the good service and low operating costs of their seven Case Tractors that, at the time this photograph was made, they had three more on order.

Case builds 25 great tractors in four power sizes—a tractor for every farm and system, every crop and acreage. Ask your Case distributor for full details.

IT PAYS TO FARM WITH
CASE

DISTRIBUTORS:

John Chambers & Son Ltd., Sole N.Z. Agents. Auckland, Wellington, Christchurch, Dunedin, Invercargill, Timaru, Hamilton, Palmerston North, New Plymouth, Ashburton, Nelson.

Pinus radiata can be kept close at the base by frequent trimming, but this usually entails some loss of height.

The most satisfactory planting method appears to be two parallel rows of trees 6ft. apart with trees 12ft. apart but those in one row midway between the trees in the other.

Pinus radiata and *Eucalyptus macarthuri* are readily raised from seed, but the eucalypt requires a little more attention when being transplanted into the fenceline.

Deciduous shelter often has a place in citrus orchards as subdivision shelter or shelter on a north or north-east boundary where protection is required only against a very occasional squall without the exclusion of too much sunlight. Lombardy poplar is very suitable for this purpose. Other suitable deciduous trees include *Betula verrucosa* (Ehrhart) (silver birch), *Prunus cerusifera* (Ehrhart) (cherry plum), and *Prunus pissardi* (Koehne). The last two besides providing efficient shelter yield early pie or jam fruit. Plums are readily raised from seed or hardwood cuttings taken in June. Poplars grow readily from cuttings set out in winter. The silver birch grows fairly freely from seed, but seed must be fresh.

Because pines and eucalypts and the deciduous trees tend to become open near the ground, it is desirable to plant them in combination with a low, compact hedge. For that purpose *Bambusa vulgaris* (Schrad) (giant bamboo), *Pittosporum crassifolium* (A. Cunn.) (karo), *Hakea saligna* (Knight) (plain-leafed hakea), or *Berberis vulgaris* (Linn.) (barberry) are satisfactory for growing in citrus districts. If possible, hedges should be planted on the sunny side of high shelter, as they make better growth there. Barberry is usually planted out with about 18in. between the plants and the row 6ft. out from the high shelter. Barberry grows readily from seed or cuttings. Seedless barberry (*Berberis vulgaris* var. *asperma*) can be raised only from cuttings or by transplanting suckers cut away from the parent plants. The seedless type is not as valuable for citrus shelter as the seeding one, because it becomes more defoliated in winter.

Shelter of medium height: In citrus areas where the contour of the land provides some natural shelter the following kinds are satisfactory both for boundary and subdividing shelter and all provide satisfactory shelter to ground level:—

Chamaecyparis lawsoniana (Parl.) (Lawson's cypress), *Cupressus benthami* (Endl.) (Bentham's cypress), *Cryptomeria japonica* (Don.) (Japanese cedar), *Bambusa vulgaris, Hakea saligna, Pittosporum crassifolium, Euonymus japonicus* and varieties (spindle tree).

The last four are usually more suitable for subdividing than for boundary shelters. *Chamaecyparis lawsoniana* is a popular shelter tree and does remarkably well on the lighter and pumiceous types of soil. On heavier and more poorly drained soils its growth is slower and weaker and trees tend to die out, leaving unsightly gaps in the rows. *Cupressus benthami* and *Cryptomeria japonica* are more suitable types for heavier and wetter soils and both are quick growing. All three types provide excellent shelter to ground level and will stand frequent trimming. They may be propagated from seed and plants should be set out in permanent positions when 2 or 3 years old; they may also be propagated from cuttings.

[*Sparrow Industrial Pictures Ltd. photo.*

The spreading limbs from a pine shelter belt adversely affecting nearby lemon trees. Plenty of room should be allowed between fruit trees and shelter belts.

Bamboos usually do well in districts where citrus trees thrive, but some varieties sucker very badly and soon take up a lot of ground. *Bambusa vulgaris* has proved a first-class shelter subject both in height and closeness. Bamboo will stand hard cutting, but has the disadvantages of being a likely harbour for rats and a fire hazard, and therefore it should not be planted near houses or packing sheds. Sets of pieces of root planted 2 to 4ft. apart soon grow into an effective shelter.

Hakea saligna grows well on the gumlands of Northland and is very popular in the Kerikeri district for boundary and subdivisional shelter. It provides excellent shelter to ground level and stands trimming. If left untrimmed, it tends to become too wide at the base, particularly for subdivisional shelter. It can be raised readily from seed sown direct along the shelter line.

Pittosporum crassifolium is a satisfactory subject for planting with eucalypts or pines to provide bottom shelter and for subdivisional shelter. It stands shade, dry soil conditions, and strong salt winds, and rate of growth is from 1 to 2ft. per year. It may be grown from seed sown along the shelter line.

Euonymus makes a very satisfactory subdivisional shelter, particularly if kept trimmed. The variegated variety is very ornamental, but must be kept trimmed and free of any green shoots if its pleasing appearance is to be maintained. It is hardy and stands both strong and salt winds very well. It may be propagated from cuttings.

The distances given in the table below may be used as a guide for planting shelter belts. The table also shows the number of years the various kinds of trees take to form effective shelter and the average height of mature belts.

Legal Requirements

Few growers are aware that their right to plant shelter trees near boundaries is subject to consent by the

Shelter Trees for Citrus Orchards

Kind of tree	Distance between trees in the row ft.	Time to form effective shelter years	Average height of mature belt (not topped) ft.
Pinus radiata	9-12	7-8	60-70
Lombardy poplar	3-6	3-4	60-70
Eucalyptus spp.	6-9	5-6	80-90
Chamaecyparis lawsoniana ..	6-8	7-9	40-50
Cupressus benthami ..	6-8	6-8	40-50
Cryptomeria japonica ..	6-8	7-9	40-50
Giant bamboo ..	2-4	3-5	20-25
Hakea saligna	2	4-5	25-30
Pittosporum crassifolium ..	2-4	5-6	15-20
Euonymus sp.	2-4	5-6	15-20
Silver birch	6-8	5-6	50-60
Prunus pissardi	2-3	4-5	15-20
Brush wattle	1½-2lb. of seed to 100yds.	1½-2	25-30
Tree lucerne	1-1½lb. of seed to 100yds.	2-3	12-15

Best by Test!

Specify the Brand "Reidrubber"

Car Tyre — for longer wear and silence with safety.

Store-Door — for long, even wear on truck or bus.

All-Purpose — tougher tread and positive traction for all haulage.

Reidrubber

TYRES AND TUBES

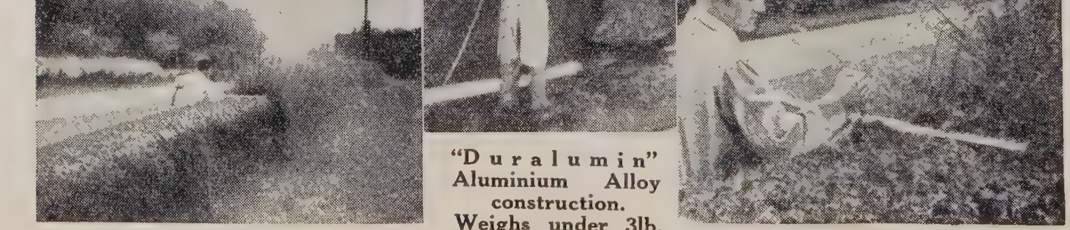
R.C.1

The World's Most Revolutionary Hedgecutter

SHEAROMATIC

A really PRACTICAL one-man cutter — driven, cleaned and lubricated by compressed air.

For hedges, ditches, verges, undergrowth, tree pruning, underwater weedcutting, etc.



"Duralumin" Aluminium Alloy construction. Weighs under 3lb.
N.Z. Distributors:

P.O. Box 1321 IBL **Ivory Bros. Ltd.** Wellington

BRANCHES AND AGENTS THROUGHOUT NEW ZEALAND

occupier of adjoining land or by the authority responsible for roads or other public land.

The position is governed by section 26 of the Fencing Act 1908, which reads:—

> (1) No person shall, whether for the purpose of making a live fence or otherwise, plant or sow gorse or trees—(a) On or alongside any boundary line or fence without the previous written consent of the occupier of the adjoining land; or (b) On or alongside any boundary line or fence bounding or abutting on any Crown lands, public reserve, or railway without the previous written consent of the proper authority having the management or control thereof.
>
> (2) No person shall under any circumstances or for any purpose plant or sow sweetbrier, bramble, or blackberry on or alongside any such boundary line or fence as aforesaid.
>
> (3) Every person who commits a breach of any of the provisions of this section is liable for every such offence to a fine not exceeding twenty pounds.
>
> (4) Irrespective of any such fine, the occupier or proper authority as aforesaid may enter on the land and cut down, uproot, and destroy all gorse or trees, sweetbrier, bramble, or blackberry planted or sown in breach of this section, and may recover the cost of so doing from the person who planted or sowed the same.

The words "on or alongside any boundary line" do not indicate how close trees may be planted without being "alongside". It was held in the Magistrates Court in 1922 that a row of willows planted about 4ft. from a boundary fence and a row of *Pinus insignis* planted about 18in. from the willows were not planted on or alongside the boundary within the meaning of section 26.

When boundary shelter is being planted care should be taken to see that trees are well within the boundary, the distance from the boundary line being determined largely by the type of tree planted, the ultimate height desired, and whether it is intended to keep the trees trimmed. Consideration of such details before planting would probably avoid any ill feeling among occupiers of adjoining land that might otherwise arise.

The Court of Appeal (New Zealand Law Reports 1922, page 122) has held that the right of an occupier to enter adjoining lands to cut down and destroy trees planted there in breach of section 26 of the Fencing Act 1908 could be lawfully exercised only after proceedings for a breach of the section had been taken against the person planting the trees and a conviction had been obtained.

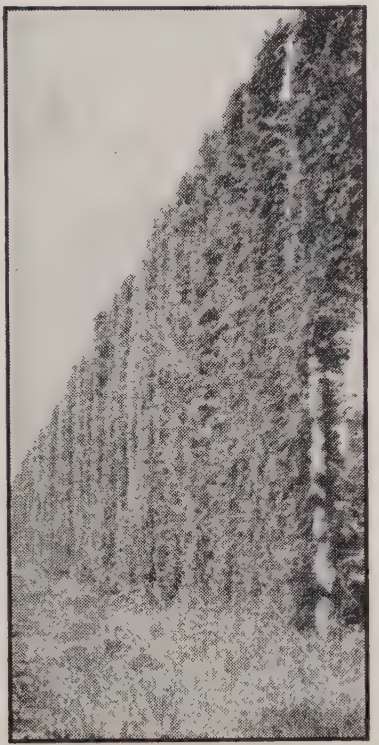
Section 37 of the Fencing Act provides that proceedings under the Act shall be in accordance with the proceedings of the Justices of the Peace Act 1908. Section 49 of the latter Act is as follows:—

> Every such information shall be laid within six months from the time when the matter of such information arose, except in cases where some other period of limitation is provided by the Act constituting the offence or any other Act.

It appears therefore, that any information against a person who contravenes the law relating to the planting of trees on boundaries must be laid within six months of the planting or sowing of the trees.

Planting of Shelter Trees

The planting of shelter should be treated with as much importance as that attached to the planting of young fruit trees. Higher yields and better fruit will be obtained from well-sheltered orchards than from orchards where shelter is inadequate or absent.



Above—Hedge of *Chamaecyparis lawsoniana* 20ft. high and trimmed to 15in. wide. Trimming was begun when plants were small. Below—Eight-year-old hedge of *Bambusa vulgaris* (giant bamboo).

[*Rendell's Photo Service photo.*

It is usual to plant permanent shelter trees during June and July. On the site intended for planting, a strip about 10ft. wide should be ploughed in autumn and disced to a fairly fine tilth just before planting. On most soils from ½lb. to 1lb. of blood and bone well worked into the soil in the position in which each tree is to be planted will assist rapid establishment. Trees should be planted at the same depth as they were growing in the nursery, which is indicated by the soil mark on the trunk. It is important to tread the soil around the roots so that trees are firm.

The varieties of temporary shelter trees recommended for planting can be established best from seed sown during spring. It is important that soil preparation should be done as carefully as that for permanent shelter.

The suppression of weed growth around young shelter trees for the first 2 or 3 years after planting will assist rapid growth.

Trimming of Shelter Belts

Trimming or pruning of orchard shelter belts should begin when the trees are young. The aim is to encourage growth near the ground and to promote density of foliage. Some species of shelter trees retain their density to the ground (provided they are protected from stock) without being trimmed, but they grow too wide and can seriously reduce the vitality and production of adjacent fruit trees if trimming is neglected. Allowing shelter to become overgrown and then severely cutting it back is most undesirable and some kinds such as *Chamaecyparis lawsoniana* and *Cupressus benthami* will not refurnish with new growth where they have been heavily cut.

On the other hand high-growing boundary trees planted with low-growing, dense species may under some circumstances produce a better windbreak if left untrimmed. In such cases a greater headland spacing between the shelter belt and the first row of fruit trees is necessary.

With most trees planted for subdividing shelter trimming is essential if maximum value from the shelter belts and good production from the fruit trees are to be secured. Quick-growing species used for temporary shelter require trimming several times a year for the first 2 years after planting.

Permanent shelter trees may require light trimming frequently in the early years, according to the width desired, but an annual trimming during winter will keep an established shelter belt in good order.

Local conditions and the situation of the orchard will determine the height at which shelter trees should be topped. When the required height is attained topping should be done as soon as possible, as if the task is delayed long, the work may become difficult and dangerous.

Reference

"Farm Trees and Hedges", Massey Agricultural College Bulletin No. 12, J. S. Yeates.

Care of Livestock during September

Contributed by the Animal Research Division

CARE OF EWES WITH TWIN LAMBS

FOR the first month or 6 weeks of life a lamb depends almost entirely on its mother's milk. Ewes are capable of producing more milk than a single lamb can drink in the early part of lactation. Twins, on the other hand, can soon drink all the milk which the ewe can produce. For this reason ewes with twin lambs should be drafted off and grazed together on good paddocks. Separation is most easily done immediately after lambing.

ROTATIONAL GRAZING OF CALVES

Well-reared cattle at Ruakura Animal Research Station outproduced their poorly reared mates by a total of 40lb. of butterfat over the first two lactations, when both groups were well fed from first calving onward. Frequent changes to good clean pasture are essential if calves are to be successfully reared. (See these notes in last month's "Journal".) This rotational grazing avoids deaths in winter, eliminates the need for drenching against worms, and produces yearlings 100lb. heavier than those kept in the one paddock for weeks at a time.

FEEDING THE MILKING HERD

Autumn-saved pasture is almost equal to high-quality spring pasture as a milk-producing fodder. It should therefore be rationed to the milking cows to make it last until the spring feed comes away and hardens up. An electric fence is essential for efficient utilisation, enabling the pasture to be grazed in small breaks. Unless sufficient reserves of this pasture are available for full feeding, the balance should be made up with silage. Enough hay should be retained to balance the lush spring growth.

CARE OF PIGS

Late-farrowed spring litters should receive special attention, as they will be approaching weaning age. Creep feeding is the secret of producing heavy weaners, and best results will be obtained by having a supply of meal and milk always before the litter. Weaned pigs must be well fed, and if meal has been used before weaning, its use should be continued for at least a fortnight to avoid an after-weaning check. The meal ration will be reduced as the skimmed milk supply increases. It is preferable to feed meal to weaners up to half their daily rations and give the milk saved to the store pigs rather than feed meal to the older pigs at this stage. Sows should be hand mated and receive sufficient milk and meal to enable them to regain some of the weight lost during the previous suckling.

VACCINATION AGAINST SCABBY MOUTH

On farms where scabby mouth occurs each new crop of lambs should be vaccinated and this operation is most conveniently done at marking. If lambs are not protected, they are likely to suffer a severe check, as the disease makes eating very painful. The vaccine gives very good protection if properly used. Care is necessary to keep the needle prong clear of grease. If it becomes blocked, no vaccine is applied and lambs may still be susceptible.

COCCIDIOSIS IN POULTRY

To prevent coccidiosis in chickens it is necessary to keep them growing steadily. Any check is dangerous. Cleanliness is very important, as the disease spreads through the soiling of food by droppings. If an outbreak occurs, sulphamezathine should be used in the drinking water. Full particulars of dosage may be obtained from the Department of Agriculture's Poultry Instructors.

MASTITIS

Mastitis is usually most prevalent in spring. Milk from all quarters should be carefully examined each day in a strip cup. If there is any abnormality in a quarter, it should be treated without delay by using three tubes of penicillin cerate at 24-hour intervals. Prompt treatment at this time of year will greatly reduce loss in production from light or dry quarters.

RICKETS IN POULTRY

Chickens reared without access to sunshine are liable to suffer from rickets. This can be prevented by using in the mash an oil with a guaranteed chick-tested vitamin D content of not less than 100 international units per c.c.; 1½ pints of oil should be mixed with every 100lb. of mash.

Dairy Produce Graded for Export

THE following figures showing quantities of dairy produce graded for export during June and for the 11 months ended 30 June 1952, with comparative figures for the same month and 11-monthly period of 1950-51, have been compiled by the Dairy Division of the Department of Agriculture from figures supplied by divisional officers at the various grading ports:—

BUTTER

	Tons				
Period	Creamery	Whey	Total	% inc. or dec.	Total tons in store at end of mth.
June 1952 ..	430	11	441	—	10,001
June 1951 ..	545	22	567	—	23,743
Inc. or dec. ..	—115	—11	—126	—22.222	—13,742
For 11 mths. to 30/6/52 ..	154,898	2,647	157,545	—	—
For 11 mths. to 30/6/51 ..	149,111	3,026	152,137	—	—
Inc. or dec. ..	+5,787	—379	+5,408	+3.554	—

CHEESE

	Tons				
Period	White	Coloured	Total	% inc. or dec.	Total tons in store at end of mth.
June 1952 ..	1,137	—	1,137	—	10,384
June 1951 ..	1,778	—	1,778	—	19,869
Inc. or dec. ..	—641	—	—641	—36.051	—9,485
For 11 mths. to 30/6/52 ..	90,318	751	91,069	—	—
For 11 mths. to 30/6/51 ..	102,787	1,526	104,313	—	—
Inc. or dec. ..	—12,469	—775	—13,244	—12.696	—

If these figures are converted into butterfat equivalent there is a decrease of 0.193 per cent. in butterfat graded for the 11 months as compared with the corresponding period of the preceding season. It should be noted that the above figures refer only to butter and cheese graded for export, and that owing to diversions which may take place from time to time, they are not necessarily a true indication of production trends.

Spring-sown Crops and Pastures: Drain Maintenance

Seasonal Notes by the Extension Division

EVERY opportunity should be taken of favourable weather at this season to proceed with the preparation of land for spring-sown crops and pastures. Production of meat and dairy produce could be increased on many thousands of farms on ploughable land if a systematic plan of pasture renewal were undertaken and inferior swards ploughed up, sown in a winter fodder crop, and resown with highly productive strains of Certified grass and clover seeds. Almost every dairy and fat-lamb farm contains one or more fields where the sward has become unproductive for one reason or another—too-frequent haying, grass-grub attack, too much or too little grazing for long periods, drought or flood, or lack of topdressing or liming. Often some fields can be rejuvenated by management or possibly by oversowing, but the quickest and best method if the sward is seriously lacking in desirable species of grasses and clovers is to plough and resow it.

AUTUMN AND SPRING SOWING OF PASTURE

Whether pastures to follow a winter root or fodder crop should be spring or autumn sown is frequently debated. Early-autumn sowing (preferably after a summer fallow) is generally considered most satisfactory in districts where early frosts are not likely to damage seedling clovers. In some drier districts autumn sowings are risky because of the likelihood of light rains after sowing being followed by a prolonged dry spell. Late-autumn sowings are risky in nearly all districts because cold and wet winter conditions retard the growth of the establishing seedlings.

Spring sowings usually establish rapidly because of abundant moisture, but annual weeds are often a problem. Some of them, such as spurrey, fat-hen, and wild turnip, are eaten readily by sheep and may be controlled by rapid grazing by large numbers of animals. Where that is not possible, mowing the weeds before they smother the grasses and clovers is advisable. On the whole, spring sowing is satisfactory provided wet weather does not delay cultivation for so long that the seed is sown just before the onset of dry weather.

SOWING UNDER COVER CROPS

Sowing down of pasture with a crop such as rape, oats, or wheat is common in arable farming areas. It has the advantage that one set of cultivation operations suffices for the sowing of both crop and pasture. However, cover crops have two great disadvantages: First, the cover crop may grow so vigorously that it partially or completely smothers out the establishing pasture; and, second, the pasture may be damaged severely during the feeding off of the cover crop. Therefore the use of cover crops is justified only when the pasture species will not be damaged by smothering or grazing and is undesirable on high-fertility land.

On medium-fertility land cover crops are sometimes of considerable value to an establishing pasture composed of slower-establishing plants such as cocksfoot and red clover. The presence of light cover in itself delays the time of grazing until much later than if the time for grazing was determined by the stage of growth of the ryegrass in the mixture.

SPRING SOWING IN THE NORTH ISLAND

In many of the northern parts of the North Island paspalum is an important constituent of swards on dairy farms. Warm conditions and a minimum of competition from other plants are necessary for it to establish successfully, so paspalum sowings should be delayed until November or December. It establishes well with November-sown root crops or with millet. Where paspalum is not included pasture is sown as soon as the weather becomes warm in spring.

The aims of working down should be consolidation and conservation of moisture. Both of these are best brought about by early-winter ploughing, which conserves moisture, and by early preliminary working, which assists consolidation. The final seed-bed for normal sowings should be fine, but for early sowing a very fine seed-bed should be avoided, as it is likely to pack down or crust in wet weather.

—S. H. SAXBY

* * *

PREPARATIONS FOR RAPE CROP

THE summer forage crop grown most extensively in New Zealand now is rape. Not only does it give a good yield of feed under most conditions, but it also plays an important role in the preparation of land for autumn-sown wheat. Rape seed is small and requires a firm, fine seed-bed for best results. To ensure this early-winter ploughing is advisable in most districts. As the crop grows during summer, one of the prime considerations in seed-bed preparation is regular harrowing to kill weeds and conserve moisture.

To reach maturity rape takes 12 to 14 weeks on heavy land and 10 to 12 weeks on the lighter soils. Times of sowing may be staggered between October and January to meet feed requirements.

CERTIFIED RAPE SEED

Certified seed of three types of rape is available to growers through mercantile channels—Broad Leaf Essex, Giant, and Club Root Resistant.

Broad Leaf Essex is a relatively short-growing, dense type with a small, fleshy stalk. Its initial growth is not as good as that of Giant, but it has powers of recovery after even two or more grazings.

Giant is a tall-growing type with a heavy, woody stem when mature. Its initial growth is better than that of Broad Leaf Essex, but it does not recover well after being grazed. The period of suitability for grazing is less critical with Giant than with Broad Leaf Essex.

Club Root Resistant is a comparatively new release which has a definite resistance to the effect of club root infection. The type of plant resembles Giant, but it produces less. Its main value is its ability to produce a valuable feed crop in club root-infected land where the other types would fail.

—O. G. MOORE

* * *

MAINTENANCE OF DRAIN OUTLETS

ANNUAL maintenance of drainage systems to ensure that they function efficiently is essential. The most important parts of a drainage system, whether it be of tiles, slabs, stones, or fascines, are the outlets, and these should be inspected each autumn to ensure that they are not choked with weeds and earth or trampled in by stock. The ditch into which they empty must enable the water to get away quickly and not back up over the outlet. If it does, the ditch should be deepened or widened to prevent this happening again, as immersed outlets cause silting and early breakdown of the drains.

Outlets should also be inspected during winter while water is flowing from them to ascertain whether any undercutting is taking place; if so, it should be repaired immediately. The best method is to cement the last two or three tiles together and pack them tightly with earth and sods. If the undercutting is too advanced to be dealt with at the time, water should be prevented from cutting back any further by placing a board for the water to flow down until a permanent repair can be made in early spring. The sods used can then consolidate and the grass take root before the following autumn.

—K. L. MAYO

Farming Potential as Guide to Land Planning

Pauatahanui - Judgeford - Horokiwi Survey

By R. H. SCOTT, Land Utilisation Officer, Department of Agriculture, Wellington, and R. T. du FAUR, Research Officer (Farm Management), Department of Agriculture, Palmerston North

MAN demands the use of land for many purposes, and since, as a general statement, it is true that the land area of a country is finite, it becomes necessary for any country as its population increases to weigh carefully the competing demands for land before a shift is made from one use to another. New Zealand is becoming more conscious of this need, and from time to time the Press contains statements in which objections are raised to a shift in the use of land; this may be encroachment of urban areas on to market garden and agricultural land or it may be the use by mining interests of alluvial flats. This article gives details of a survey which was made by the Department of Agriculture in connection with a proposed change in use of agricultural land in the Pauatahanui-Judgeford basin-Horokiwi Valley area near Wellington.

SIX basic uses for land suggested by L. D. Stamp, Professor of Geography, London University, who is also well known as the Director of the Land Utilisation Survey of Britain, are:—

1. A source of food supply.
2. A place to work: the demand of industry for land for factories.
3. A place to live: the demand for sites for homes.
4. A place for recreation: sports grounds, golf courses, national parks, etc.
5. The need for mobility; under this heading comes land for roads, railways, aerodromes.
6. The need for security; here the demands of the fighting services for training grounds have to be considered.

Planning Legislation

New Zealand has legislation which enables some cognisance to be taken of the various demands of man for the use of land. In 1926 there was passed the Town Planning Act, which placed all boroughs over 1000 in population under a statutory obligation to prepare town-planning schemes, and at the same time provision was made for the preparation of "extra-urban" planning schemes by county councils. The latter schemes are required to take into account the present and future requirements of the rural areas to which they apply and also the geographical and economic relationship of the areas to any neighbouring cities or boroughs. Once a scheme is approved by the Government Town Planning Board a local authority can enforce its provisions. Thus if an approved scheme provides that a certain area is to be used for agricultural purposes and a request is made that part of the land be subdivided for dwelling sites, the local authority will not consent to the subdivision.

In 1929 an amendment to the main Act was passed making provision for the preparation of regional planning schemes. Several local authorities can combine for the preparation of a scheme to cover an area which has a community of social and economic interests. The committee formed to draw up a scheme consists of representatives of local authorities within the region, and others with special knowledge can be co-opted. The schemes to be prepared by regional planning committees have to deal, among other things, with communications and transport and the allocation of land for urban development, agricultural purposes, and public utilities and amenities. The functions of the committees are advisory, and they make recommendations to the local authorities within their region on the preparation of town planning and "extra-urban" planning schemes or on any matters which relate to these schemes.

In effect for the planning of land resources the organisation provided for by legislation is:—

A regional planning committee, which can make recommendations on the utilisation of land resources within a region.

Local authorities within a region (cities, boroughs, town districts, and counties), who can implement the recommendations of the regional planning committee by incorporating them in their plans for the use of land within the areas they control.

A town planning board, which can approve of these plans and thus enable a local authority to enforce the provisions of its town planning or "extra-urban" planning schemes.

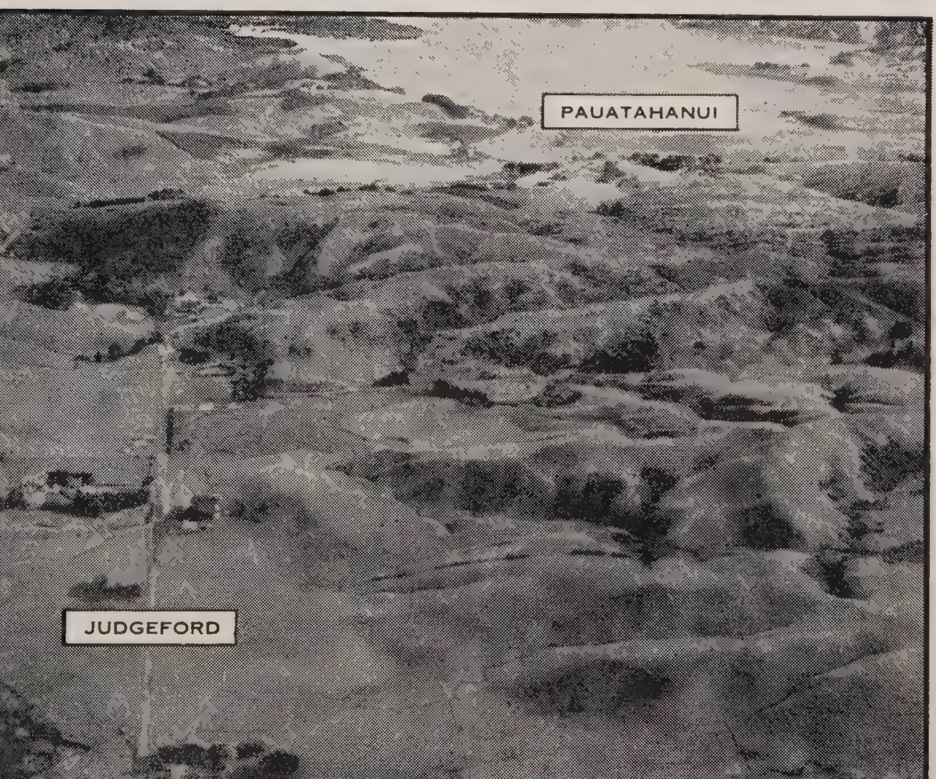
The depression of the early 1930's and the Second World War resulted in very little being done on the lines of planning land resources in the Dominion, but today some work is being done, of which that of the Wellington Regional Planning Council is an example. The Wellington region comprises the Counties of Hutt and Makara, the Cities of Wellington and Lower Hutt, the Boroughs of Upper Hutt, Petone, and Eastbourne, and the Town Districts of Johnsonville and Tawa Flat. The council when considering the future development of the region has endeavoured to weigh all the competing demands for land and this article includes information collected on behalf of the council.

Future of Farming Area

The future of the Pauatahanui-Judgeford basin-Horokiwi Valley area has had to be considered by the Wellington Regional Planning Council and one aspect on which the council required information was the present farming systems in the area and its farming prospects. The Department of Agriculture undertook the survey, which from its point of view became one of assessing the farming potential.

Location

The area is approximately 18 miles north of Wellington and 10 miles north-west of Lower Hutt by road. There is a good road passing through



At left—Aerial view of Pauatahanui-Judgeford basin; the start of the Horokiwi Valley is in the upper right of the photograph. Ministry of Works photo.

the basin from Lower Hutt to the main north highway at Paremata, and the old main north highway passes through Pauatahanui and up the Horokiwi Valley to Paekakariki. Communication with Wellington is by road and proximity to the city has had a considerable influence on the farming systems adopted. There are 35 farms in the area which might be affected partly or completely by any shift in land use.

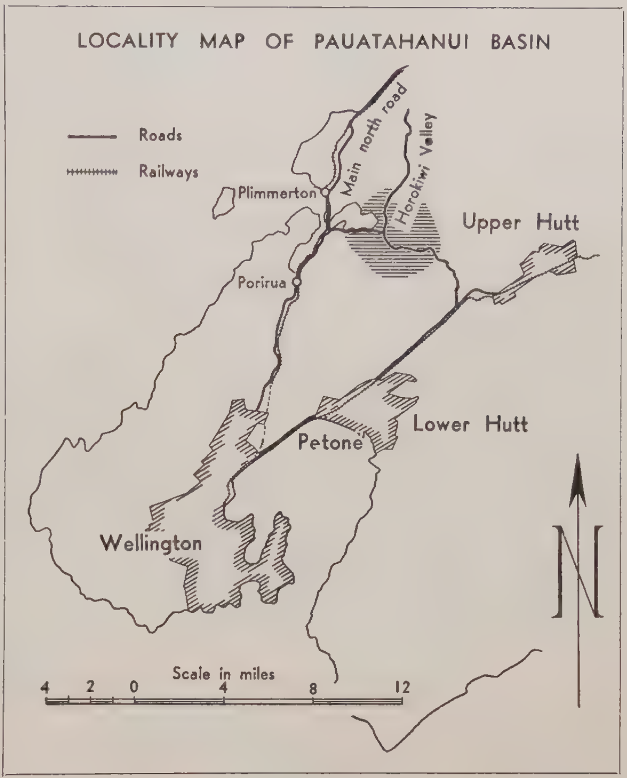
Historical

The district was one of the earliest settled around Wellington, most of the land having been taken up in the 1840's and 1850's. Some of the present occupiers are descendants of the original settlers and there is evidence of less intensive land development and utilisation than in areas where greater difficulties in the financing of properties by new settlers have been a spur to steady improvement and increased production. However, during recent years there have been changes and some farms are being developed into highly productive units.

Topography and Climate

Most of the 35 farms have flat land in the valleys and the greater part of their areas is flat and easy to moderately rolling country. However, some farms have country reaching heights of over 500ft. where there are some steep faces, but generally grades are reasonable and with tracks made by bulldozers it is possible to reach most parts of the farms with tractors. Several farmers have constructed these tracks to facilitate topdressing the steeper portions of their farms.

The district is quite well watered, being served by two main streams, one running down the Horokiwi Valley and the other through Pauatahanui-Judgeford. Into each of these, smaller streams flow from the lateral valleys. Lack of water for stock is not a problem.



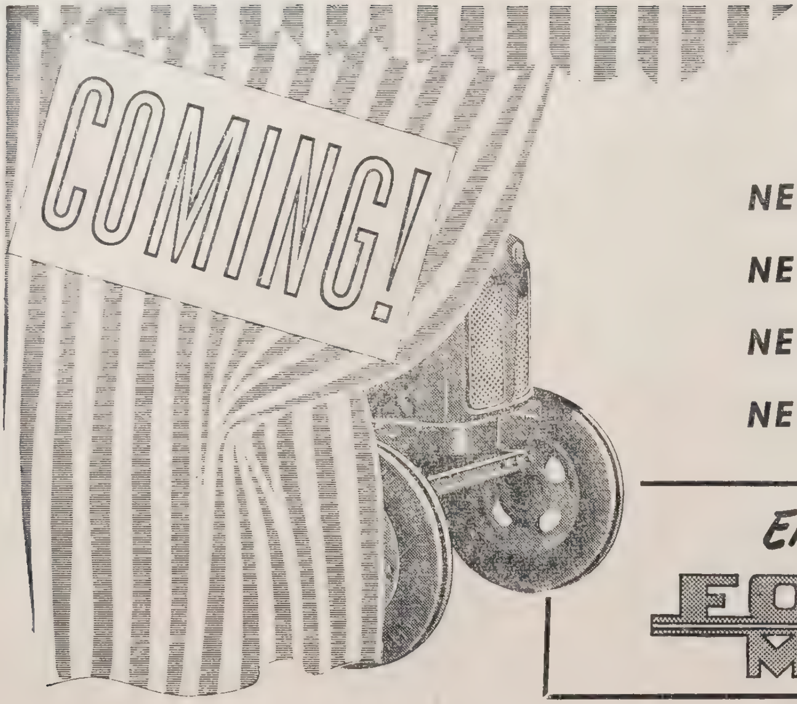
The annual rainfall in the valleys is approximately 40in. per annum, which is fairly well distributed, the wettest months usually being June and July, when the average monthly fall is between 4in. and 5in. On the surrounding hill country the annual precipitation is nearer 60in. The southern side of the Pauatahanui-Judgeford basin, with slopes facing north, has a less effective rainfall than the north side of the valley; facing the prevailing northerly winds, this section dries out more in summer than other portions.

The average monthly temperature in the area near Porirua Harbour ranges from approximately 48 degrees F. in June to a little over 61 degrees F. in January and February, but inland in the valleys the annual temperature range is greater. Here frosts are common in winter and there is a decided check to pasture growth. Also in these parts the summer temperatures are higher, as the moderating effect of any southerly or sea breezes is cut off by the surrounding hills, this being particularly so in Pauatahanui-Judgeford.

Soils

The soils of the valley floors have been built up by the streams running down the Horokiwi and the Pauatahanui-Judgeford Valleys and they are

Rolling country, Pauatahanui basin. These are improved pastures of ryegrass, white clover, and subterranean clover.



All New for '52!

NEW design—
smartly streamlined!
NEW O.H.V. Engines—
3 to choose from!
NEW Transmission—
a gear for every job!
NEW surprisingly new,
standards of value!

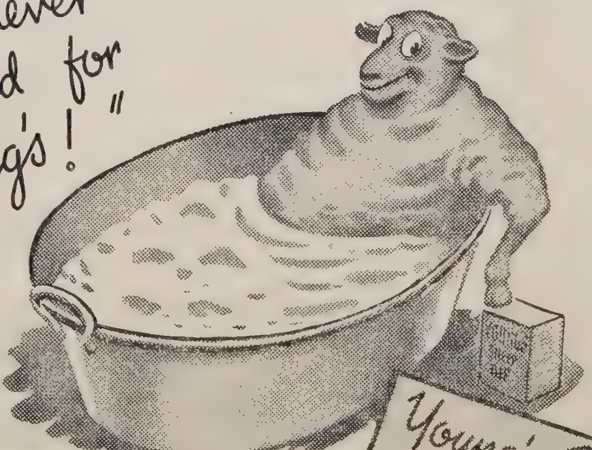
Entirely New
FORDSON MAJOR

SEE IT SOON AT YOUR NEAREST OF THE 80 FORD DEALERS

FORD MOTOR COMPANY OF NEW ZEALAND LIMITED LOWER HUTT

211.

"You're never too old for Young's!"



YOUNG'S SHEEP DIPS
JASON FINDS THE GOLDEN FLEECE

YOUNG'S "GREEN LABEL" PASTE DIP: This special non-arsenical Paste Dip combines Benzene Hexachloride ("Gammexane") and Phenols in a form which ensures that these ingredients are always present in sufficient strength to destroy keds (ticks) and lice.

YOUNG'S "YELLOW LABEL" PASTE DIP: Gives efficient protection against Blow Fly. Destroys keds and lice at one dipping. (Arsenical.)

YOU CAN ALSO RELY ON:

- YOUNG'S IMPROVED SHEEP DIP POWDER
- YOUNG'S RED LABEL PASTE
- YOUNG'S DEFLY SPRAY
- YOUNG'S FOOT-ROT SOLUTION
- YOUNG'S FOOT-ROT PASTE

Young's Sheep Dips keep your flock Healthy & Happy!

Sole Agents and Distributors for New Zealand for the full range of YOUNG'S PRODUCTS, THE FARMERS' CO-OP WHOLESALE FEDERATION (N.Z.) LTD., Dominion Farmers' Institute Building, P.O. Box 1124, Wellington.

And all Farmers Co-operative associations
and their Agents throughout the Dominion.

YOUNG'S
SHEEP DIPS

the most fertile in the region, being high in phosphates and relatively high in other plant nutrients, and high-producing ryegrass-white clover pastures have been established on some of the farms on these soils. The soils of the terraces and rolling country are moderately fertile, but are low in phosphates. However, good ryegrass-white clover pastures have been established by those using superphosphates and lime. The soils of the hillier and steeper parts are also moderately fertile and are stable, there being little evidence of erosion.

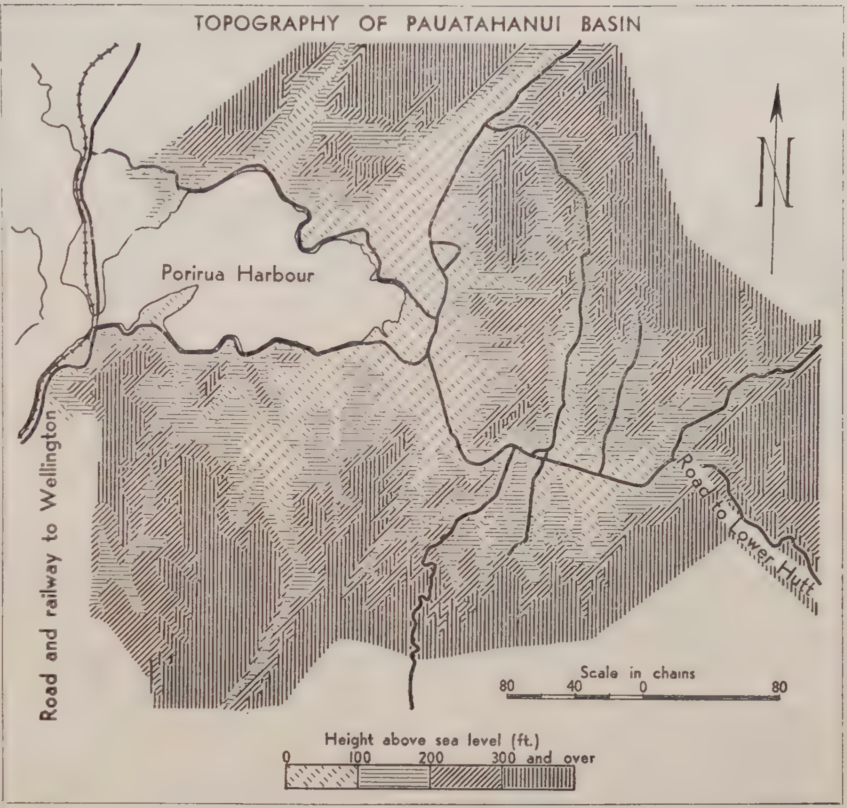
Vegetative Cover

Considerable portions of a number of farms in the district are partly or completely covered in gorse, tauhinu, scrub, and bracken and hard fern. An assessment of the area so covered was made on some farms, the survey covering an area of 8247 acres. Classification of the area is set out in Table 1.

TABLE 1—AREA IN CLEAN PASTURE, GORSE, AND SCRUB

Classification	Area acres	Percentage of area
Clean pasture ..	5,701	69.2
Scattered scrub, gorse, etc.	1,703	20.6
Completely covered in scrub, gorse, etc. ..	477	5.8
Bush or plantations ..	150	1.8
Other	216	2.6
Total	8,247	100.0

Although the area of clean pasture is 5701 acres, only 2300 acres comprised pastures containing some white clover, 1970 acres contained some annual clover, and 1430 acres contained no clovers. Thus of an area of 8247 acres only 28 per cent. was in reasonably good pasture.


TOPOGRAPHY OF PAUATAHANUI BASIN

Farm-management Practices

Dairy Farms

All the dairy farms are town-supply units, the milk going to the Wellington City Corporation Milk Department. There is a considerable variation between farms in the yield of butterfat per acre (Table 2), and though this is due partly to the differences in soil types and topography, the main contributing factor is difference in efficiency of management.

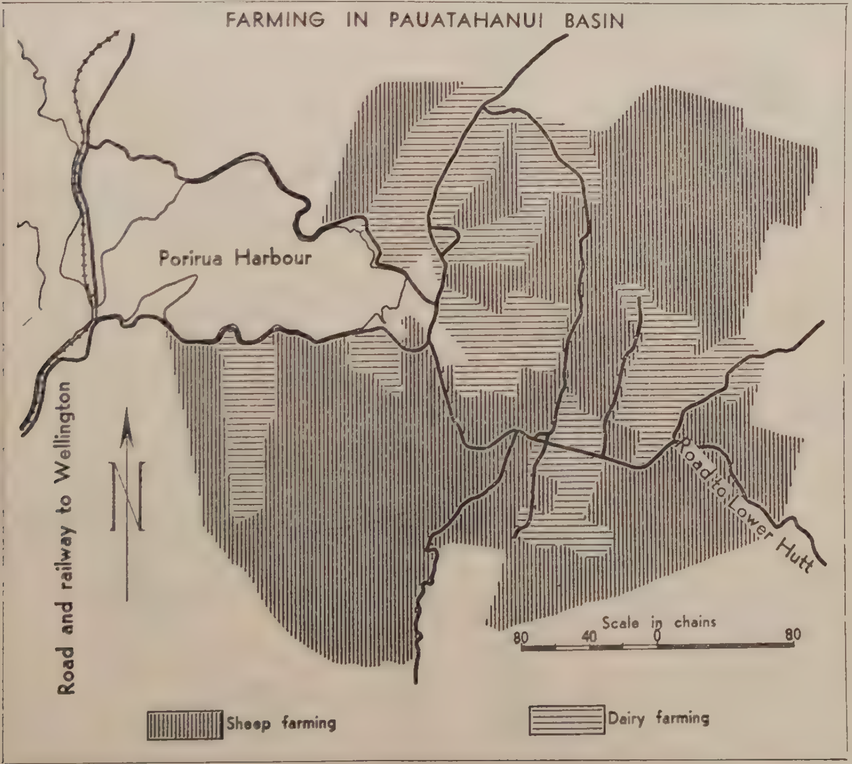

FARMING IN PAUATAHANUI BASIN

TABLE 2—BUTTERFAT YIELD PER ACRE ON DAIRY FARMS

Butterfat per acre lb.	No. of farms
20 and under 40	2
40 and under 60	2
60 and under 80	5
80 and under 100	6
100 and under 120	2
120 and under 140	1
	18

The main winter supplementary feed is hay, 13 of the 18 dairy farms adopting the practice of shutting up areas for hay. Six farmers grow some turnips and chou moellier in addition to saving hay. The grassed areas usually receive 2cwt. to 3cwt. of superphosphate per acre annually, although on one farm topdressing had never been done.

In the past the practice has been to purchase herd replacements mainly from local stock sales and consequently herds have become very mixed. However, this practice is changing and 10 out of 18 dairy farmers now breed all their replacements, 6 purchase replacements, and 2 purchase portion and breed portion. The quality of the herds is improving.

Sheep Farming

Sheep farming is carried on mainly for the production of store sheep; only 6 of the 17 sheep farms sell fat lambs.

5 types

OF

Power Plus

BATTERIES TO FIT

ALL MAKES

of cars, trucks, tractors.

Replace with a

Ford

BATTERY

Five types . . . 9-plates to 15-plates . . . ensure the correct battery whatever make you drive. From Ford Dealers, leading garages and service stations.

FORD MOTOR COMPANY OF NEW ZEALAND LIMITED LOWER HUTT

69.9

---

9 months' increased Butterfat - *for one month's feeding*

FEEDING TOMOANA DAIRY RATION now puts the cows into top gear so that they make the fullest use of the grass when it comes away.

Hundreds of successful dairy farmers have proved that the early spring feeding of TOMOANA DAIRY RATION gives results right through the milking season. It's not just the extra production at the time that makes it worthwhile: it's the extra production for all the months ahead that counts—made possible by building health and stamina at the critical time.

Remember that, whatever their natural productive capacity, your cows will only produce to the full if their protein feed is ample for the job.

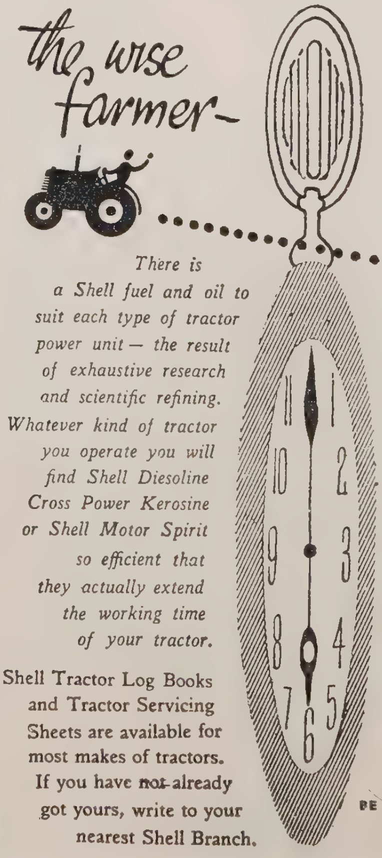
FEED

TOMOANA DAIRY RATION

NOW

THE SHELL COMPANY OF NEW ZEALAND LIMITED (INCORPORATED IN ENGLAND)

the wise farmer-



....lengthens the working time of his tractor

There is a Shell fuel and oil to suit each type of tractor power unit — the result of exhaustive research and scientific refining. Whatever kind of tractor you operate you will find Shell Diesoline Cross Power Kerosine or Shell Motor Spirit so efficient that they actually extend the working time of your tractor.

by insisting on

SHELL DIESOLINE
CROSS POWER KEROSINE
SHELL MOTOR SPIRIT

Shell Tractor Log Books and Tractor Servicing Sheets are available for most makes of tractors. If you have ~~not~~ already got yours, write to your nearest Shell Branch.

BE SURE—INSIST ON SHELL

TF3·2A

Where fattening is done the usual practice is to sell the lambs in small lots through saleyards to butchers.

Some farmers retain their ewe lambs for flock replacements, 7 purchase all their requirements, and 1 breeds portion and purchases portion.

There is a considerable variation in lambing percentages, but the majority of the farmers obtain a percentage between 80 and 90. The flocks comprise mainly Romney and Romney-cross ewes, except in one case where some Cheviots were run as well as Romneys. Romney rams are used, but those who fatten lambs use Southdown rams.

Not all the sheep farmers are top-dressing pasture, but during recent years the quantity of superphosphate used has increased and some farmers have applied fertilisers to the hillier portions of their farms by aeroplane. A feature on many of the sheep farms is the lack of shelter.

Carrying Capacity

To make comparison between farms and between dairy and sheep farms the number of stock on each farm was converted to a common stock unit called the "ewe equivalent".

The total area occupied by predominantly sheep farms totalled 9944 acres, of which 4651 acres comprised 8 blocks of hill country outside the Pauatahanui-Judgeford area held by 5 farmers whose home farms were within the area. This outside hill country is poor, being relatively high and broken. Taking it into account when assessing the carrying capacity per acre of the sheep farms (Table 3) has had the effect of making the figure for the land at Pauatahanui-Judgeford lower than it is.

TABLE 3—CARRYING CAPACITY IN EWE EQUIVALENTS PER ACRE ON SHEEP FARMS

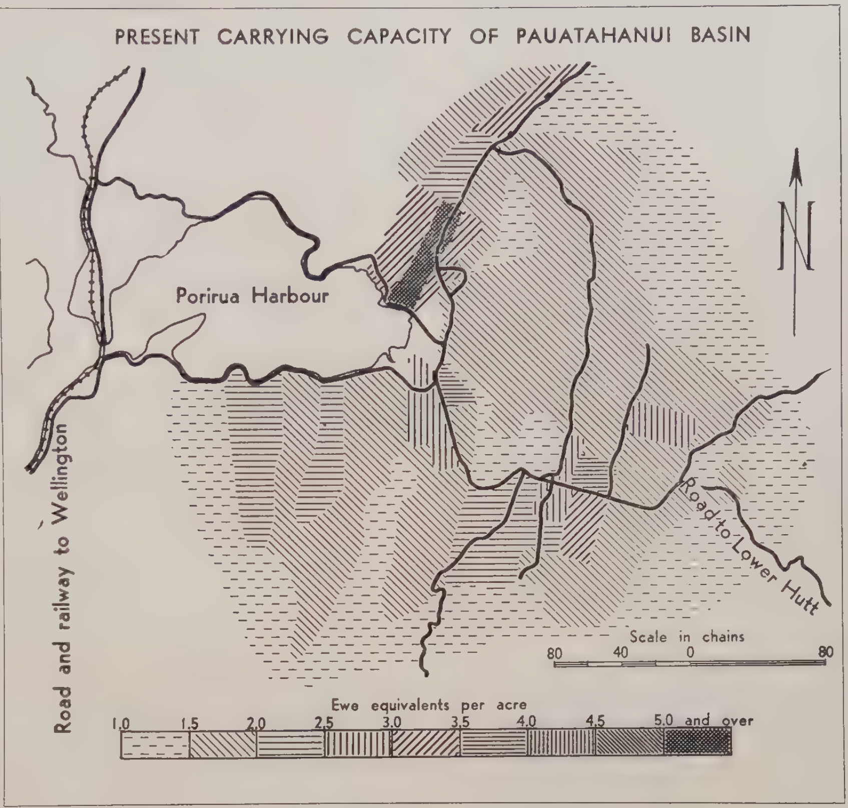
Ewe equivalents per acre	No. of farms
Under 1.0	2
1.0 and under 1.5	5
1.5 and under 2.0	6
2.0 and under 2.5	3
2.5 and under 3.0	1
	17

Carrying capacity ranged from 0.90 to 2.93 ewe equivalents per acre, this being due to the differences in the three factors soil, topography, and management efficiency.

On the 18 dairy farms, which occupy 4531 acres, 1221 dairy cows were run, of which 991 were milked during the flush of the season. Butterfat production amounted to 199,660lb. Other stock on these farms include 990 ewes, 1150 ewe hoggets, 73 other sheep, and 70 other cattle. When all the stock were converted to ewe equivalents the stock units carried per acre on the dairy farms ranged from 1.28 to 3.57, with one holding carrying 5.02.

TABLE 4—CARRYING CAPACITY IN EWE EQUIVALENTS PER ACRE ON DAIRY FARMS

Ewe equivalents per acre	No. of farms
Under 1.5	1
1.5 and under 2.5	9
2.5 and under 3.5	6
Over 3.5	2
	18


PRESENT CARRYING CAPACITY OF PAUATAHANUI BASIN

On the total area of 14,475 acres, of which 4651 acres is relatively high and broken country and is outside Pauatahanui-Judgeford, there are carried 16,046 sheep, 1296 dairy cows, and 441 other cattle. These figures converted to the common unit give 23,259 ewe equivalents, or an over-all average carrying capacity of 1.6 ewe equivalents per acre.

Potential Carrying Capacity

In assessing a figure for the potential carrying capacity of each farm the soil types and the topography of each unit were taken into account, and with management efficiency it was assumed that the standard would reach that of the most efficient farmers in the district.

TABLE 5—PRESENT AND POTENTIAL STOCK ON SHEEP FARMS

	Present	Potential	Percentage increase
Ewe equivalents	12,246	17,435	42.4
Cattle (all classes)	477	966	102.5
All stock converted to ewe equivalents	13,955	20,823	49.2

Whereas at present on sheep farms the most common carrying capacity is between 1.5 and 2.0 ewe equivalents per acre, the most common potential carrying capacity is assessed at between 2.5 and 3.0 ewe equivalents per acre.

The potential number of dairy cows on the dairy units is estimated at 1551, which is an increase of 27 per cent. on present numbers.

TABLE 6—PRESENT AND POTENTIAL STOCK ON DAIRY FARMS

	Present	Potential	Percentage increase
Dairy cows	1,221	1,551	27.0
Other cattle	39	27	—30.8
Sheep (all classes)	2,213	3,098	40.0
All stock converted to ewe equivalents	9,304	12,505	34.4

The annual production of butterfat is now 199,660lb. and the potential production is estimated at 307,100lb., an increase of 53.7 per cent. The most common production of butterfat per acre is now between 80 and 100lb. and the most common potential production is estimated at between 120 and 140lb. per acre; some will reach much higher per-acre production.

Effect of Changed Land Use

If any shift in land use is made, it is estimated that 1693 acres of the sheep farms may be affected and 1462 acres of the dairy farms, these areas comprising the valley floors and the moderately rolling country.

Sheep farms: The present number of ewe equivalents carried on sheep farms is 13,955, and if 1639 acres of these farms is used for other purposes, it is estimated that the balance areas of the farms will carry 9880 ewe equivalents, which represents a loss of 29.2 per cent. in stock units. The potential carrying capacity of the sheep farms in ewe equivalents is 20,823, and a loss of area would mean a reduction to 15,050 ewe equivalents. Many of the balance areas of the sheep farms would represent uneconomic units and it is likely that some of them would go out of production, in which case the actual reduction in stock numbers resulting from a shift in land use would be greater than the estimates.

Dairy farms: The dairy farms at present carry 1221 dairy cows, 39 other cattle, and 2213 sheep of all classes. If 1462 acres of these farms is subject to a change in land use, the total stock carried will be reduced to 460 dairy cows and 2000 ewe equivalents, a reduction of 62.3 per cent. in dairy cow numbers. When all stock on dairy farms is converted to ewe equivalents the reduction amounts to 48.6 per cent. On the basis of potential carrying capacity dairy cow numbers would be reduced from 1551 to 545, a 64.9 per cent. reduction.

The present annual loss in butterfat production is estimated at 136,000lb., and on the basis of potential production the loss is estimated at 196,000lb.

If the loss in production on dairy farms is regarded on the basis of whole-milk production, the loss on the basis of present production would be sufficient to provide 6300 persons with their annual whole-milk requirements.

As with the sheep farms the estimated loss in production on the dairy farms resulting from a shift in land use of part of their areas is likely to be much greater than shown, since the balance areas of the farms will in most instances be uneconomic and some of the areas may go out of production unless amalgamated with other land.

Neglected Farm Land

The survey illustrates an undesirable feature of some New Zealand cities and larger urban areas. Around some of them is a fringe of rather neglected farm land lying between the boundary of the urban area and the actual farm land. These neglected areas are grounds for the growth of noxious weeds and are also areas where farm production is at a very low level. As towns expand and farm lands become closer to urban amenities a form of betterment is created and there appears to be a tendency for some occupiers on the urban fringe to relax their endeavours because of the prospect of converting the betterment into a cash return. Careful and orderly planning of land resources may do much to alter this and to bring about the efficient utilisation of this neglected and non-productive land.

Main Points

The main points shown by the survey of the Pauatahanui-Judgeford basin and Horokiwi Valley area were:—

1. The main physical factors which determine land use (topography, climate, and soils) are suitable for both dairy farming and sheep farming for the production of fat lambs, store sheep, and wool.
2. Production from the area can be increased considerably:—
   - (a) Dairy cow numbers can be increased by approximately 27 per cent.
   - (b) Other stock, converted to ewe equivalents, can be increased by approximately 50 per cent.
3. As a result of a suggested shift in land use of 1462 acres of the dairy farms and 1693 acres of the sheep farms the minimum losses are likely to be:—
   - (a) On the basis of present carrying capacity: Dairy cow numbers are likely to be reduced by approximately 850 and other stock, converted to ewe equivalents, by 3530.
   - (b) On the basis of potential carrying capacity: Dairy cow numbers are likely to be reduced by approximately 1000 and other stock, converted to ewe equivalents, by approximately 5290.

Though in the final issue it is not for agricultural interests to say whether or not a particular area of agricultural land should be used for purposes other than farming, at least their claims should be given similar consideration to those of others who compete for the use of the land. If this is done, there is the possibility that good farming land will not be utilised for some less urgent purpose.

METEOROLOGICAL RECORDS FOR JUNE

Station	Height of station above M.S.L. (ft.)	Air temperatures in degrees (Fahrenheit)				Rainfall in inches					Bright sunshine hours
				Absolute maximum and minimum					Maximum fall		
		Approx. mean	Difference from normal	Maximum	Minimum	Total fall	No. of days of rain	Difference from normal	Amount	Date	
Kerikeri	201	53.6	+ 1.5	69.5	33.5	4.68	24	+ 2.40	1.34	17	104.0
Auckland	160	54.6	+ 1.6	65.9	39.9	6.13	28	+ 0.74	0.66	1	80.8
Tauranga	10	52.0	+ 2.1	64.1	30.4	5.17	24	— 0.38	0.83	17	96.8
Ruakura	131	50.0	+ 2.5	63.8	25.0	8.88	25	+ 4.10	1.37	21	53.3
Rotorua	969	47.8	+ 1.4	60.5	27.0	10.65	25	+ 5.33	1.62	2	66.8
Gisborne	12	49.8	+ 0.5	66.4	28.4	1.93	13	— 2.28	0.92	17	135.6
New Plymouth ..	160	51.6	+ 1.5	61.3	37.5	8.23	24	+ 2.05	1.71	4	74.0
Napier	5	50.6	+ 1.9	68.9	27.9	1.38	7	— 1.68	0.61	3	152.8
Karioi	2125	43.4	+ 1.9	58.0	24.0	8.73	19	+ 2.63	1.12	1	
Wanganui	72	50.2	+ 1.4	64.1	29.6	9.83	22	+ 6.44	1.81	22	96.9
Palmerston North .	110	48.6	+ 1.6	63.0	29.2	7.76	23	+ 3.41	1.05	1	87.7
Waingawa	350	46.6	+ 1.2	63.0	23.5	4.86	23	+ 0.77	1.28	22	113.2
Wellington	415	48.4	+ 0.7	59.4	44.2	8.08	19	+ 3.43	1.18	22	114.0
Nelson	5	45.0	+ 0.9	60.3	22.4	5.67	18	+ 2.38	1.12	4	127.6
Blenheim	12	46.1	+ 0.7	63.8	24.3	3.99	13	+ 1.51	1.12	1	152.9
Hokitika	12	44.3	+ 0.0	58.2	27.4	12.42	22	+ 3.59	1.72	1	82.7
Hanmer	1270	39.2	— 0.5	61.8	16.6	4.08	19	+ 0.59	0.64	26	80.6
Christchurch ..	22	43.2	— 0.5	65.2	23.4	1.63	13	— 0.96	0.60	4	108.6
Ashburton	323	42.4	+ 0.6	67.0	21.4	1.58	9	— 1.02	0.42	12	109.0
Timaru	56	40.6	— 1.8	59.0	23.6	0.92	7	— 0.95	0.55	1	109.8
Alexandra	520	36.8	— 0.9	62.8	15.9	1.19	8	+ 0.40	0.25	7, 25	89.9
Taieri	80	40.6	— 1.2	63.6	21.0	1.69	12	— 0.63	0.58	11	90.8
Invercargill ..	32	40.6	— 1.8	57.0	25.0	3.40	17	— 0.37	0.64	26	58.3

BOOK REVIEW

"John Grigg of Longbeach": P. G. Stevens

THIS short biography is perhaps more the record of an estate than the story of a man's life, but, as the author remarks, Grigg "submerged his personality in the swamps of Longbeach" so much so that the two became completely identified. The author deals briefly with Grigg's upbringing in Cornwall (his family were of Scottish extraction) and his decision to sell the family farm and emigrate. Coming to Auckland in 1854, he leased a property at Otahuhu which he held 10 years. He must have been an industrious and astute farmer and his success as a breeder was shown by the widespread demand for sheep, from the stud Leicester flock which he had built up, at his clearing sale.

Otahuhu was only a short interlude in Grigg's career and in 1864 he sold out and moved to the South Island, for it seems that he had purchased Longbeach the previous year. Over the next 20 or 30 years the development of Longbeach was pushed ahead with great energy, though the destruction of all records in the homestead fire of 1937 makes it impossible to follow the changes in chronological order.

Grigg's achievement in converting this "impenetrable swamp" into one of the finest farms in New Zealand was not unique; at the same time other men in the South Island were developing large arable farms, but his task was perhaps greater and the final result more striking. More important than his achievements as an arable farmer was his link with the establishment of the meat export trade and the subsequent scale of his fat-lamb farming. A few carcasses from Longbeach were in the Dunedin when it left Port Chalmers in February 1882, and a few months earlier Grigg had convened a meeting to form the Canterbury Frozen Meat Company. His insistence that only first-grade stock be accepted for export was largely responsible for establishing the reputation of Canterbury lamb.

In time about half the original 30,000 acres was sold and so the Longbeach tradition was passed on not only by the Grigg family but by many of those who had worked on the estate and were given an opportunity to purchase land on favourable terms. Yet in a period when many, though by no means all, of his contemporaries regarded land as something to be bought and sold when a favourable opportunity appeared Grigg showed the worth of a sound farming tradition, and his example must have done something to inculcate it in others.

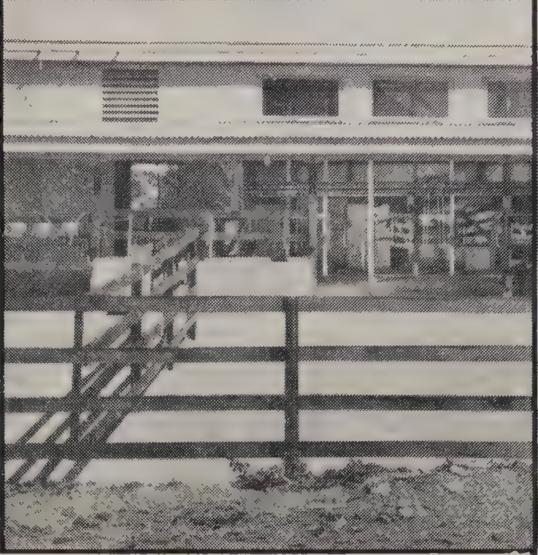
—*P.R.S.*

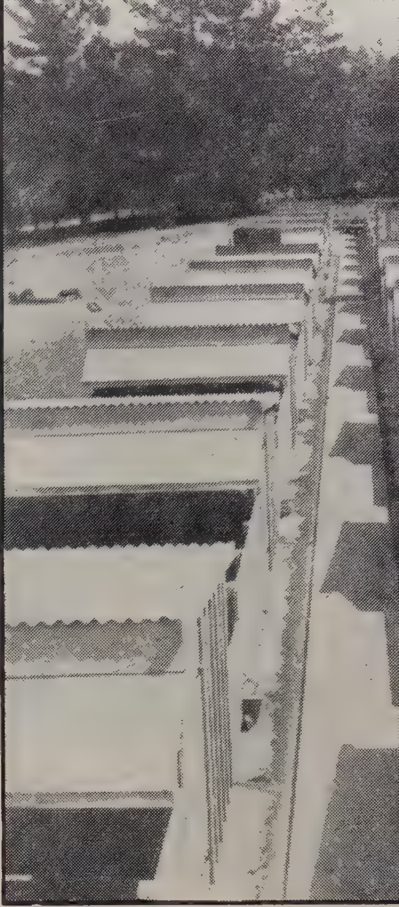
Whitcombe and Tombs Ltd. 9s. 6d.

Publications Received

"Animal Nutrition", Leonard A. Maynard (3rd ed.). McGraw-Hill Book Co. Inc., N.Y.

"Gazetteer of Agricultural and Forestry Research Stations 1952". Commonwealth Agricultural Bureaux, England. 30s. net.





The Influence of Hygiene on the Health of Livestock

FROM earliest times the keeper of animals has realised the importance of disease among livestock and the danger of diseased animals both to others of their kind and to man. In modern times, with the call for higher and higher production resulting in concentrated farming and progressive development of highly producing stock, not always selected on health attributes, more and more care is required to prevent dissemination of disease in stock. That application of the principles of hygiene can have a potent influence on control of disease is shown in this article by G. V. Wallace, Veterinarian, Department of Agriculture, Auckland.

IN New Zealand the Stock Act 1908 governs the legal aspect of health in farm stock, but many farmers do not realise all the implications of the Act. For instance, it is illegal to feed raw offal to dogs and uncooked meat to pigs; carcasses must not be thrown in waterways or left unburied within ½ mile of a highway; diseased stock must be burnt or buried; no diseased or ailing beasts may be exposed in public places such as saleyards or roads; and annual dipping of sheep is compulsory. These and other regulations have been written into the Act for the livestock owner's benefit with the one idea of attaining a high standard of animal health through sound sanitation and hygiene.

Even the Dominion's quarantine laws and regulations contribute to veterinary hygiene, and by their enforcement such scourges as rinderpest; foot and mouth disease and pleuro-pneumonia in cattle, Newcastle disease in poultry, rabies in dogs, glanders in horses, and swine fever have been kept out.

The Stock Act 1908 came into being as the result of an awakening to the threat of the rinderpest scourge of the 1850's. Under the Diseased Cattle Act 1861 provision was made for compulsory slaughter of cattle, and in this way the 1864 pleuro-pneumonia outbreak in the South Island was stamped out. Compulsory dipping of sheep began in the 1860's, and in 1878 the Sheep Act was passed to enable the eradication of sheep scab. Amendments to the original Stock Act of 1893 were added in 1895, 1898, 1903, and 1907, and finally all were combined in the 1908 Act. Other amendments have since been made to this Act, and the whole Act is being redrafted at present.

Food and Water

To retain their health animals require proper food and water. A properly fed animal receives a balanced ration, which, under the grassland system, implies adequate provision of hay and silage against periods of scarcity. Feed must be clean and the diet must include the necessary vitamins and trace elements, for many of the ills to which cattle are subject are caused by wrong feeding.

The water supply must be kept as free as possible from animal droppings, as worm eggs and bacteria are readily transmitted to stock by the drinking water. Provision should be made for animals to be watered from troughs or running streams, and troughs should be cleaned out frequently and, ideally, after being emptied be swabbed out with a bluestone solution before being refilled.

Hygiene in Early Life

Fortunately New Zealand is not subject to many of the major animal scourges, but excessive wastage is still caused by preventable diseases. Extension of veterinary services and enlightened farming procedures will no doubt reduce these losses.

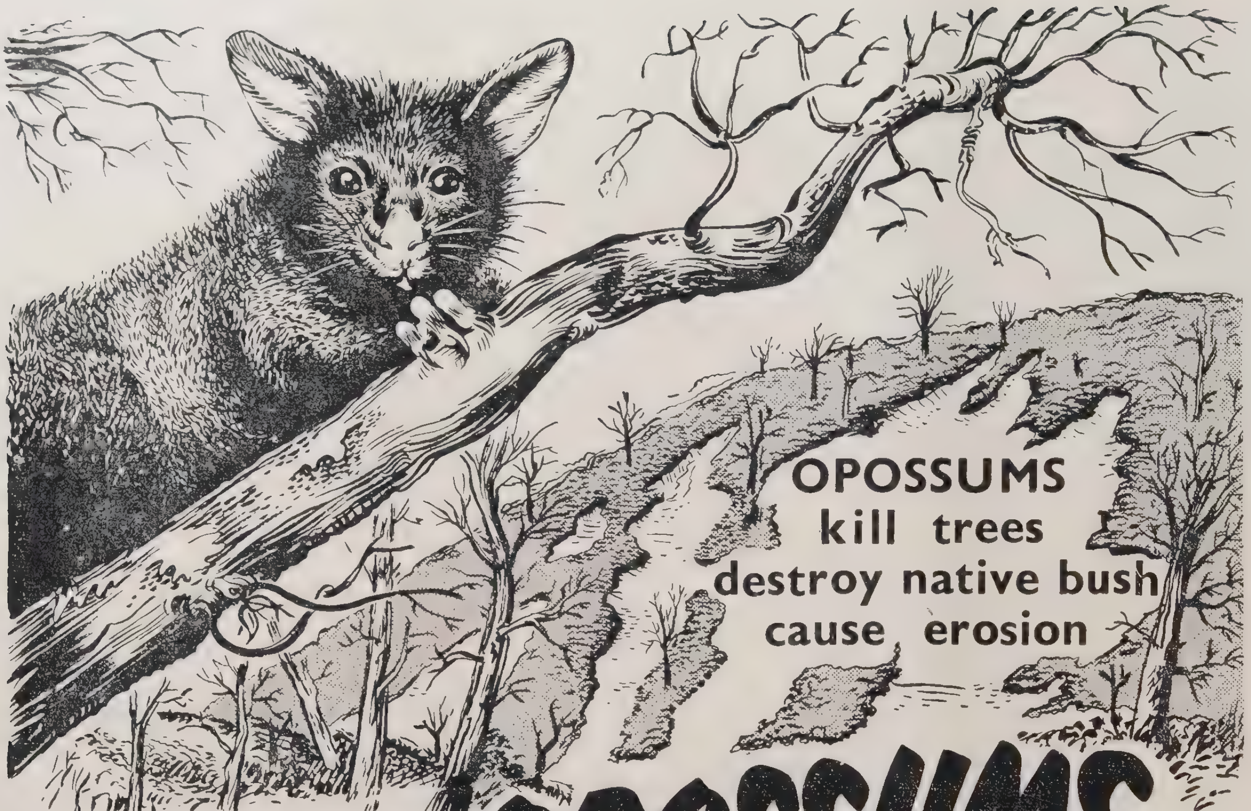
The principles of hygiene should be applied from the birth of an animal. The young animal derives anti-bodies from the first milk or colostrum of its mother, and until the offspring has a high anti-body content and can make its own anti-bodies it is very susceptible to infection and can offer little resistance to invading organisms.

Calf Scours

One of the most common results of bad hygiene is an outbreak of calf scours. Dirty feeding buckets, dirty surroundings, and misfeeding often give rise to white scours. Predisposing causes are failure to feed colostrum to the calf, too high a butterfat content in the milk from the mother, and, most important, overfeeding resulting in the forming of an indigestible curd. Exciting causes are feeding under dirty conditions from poorly cleaned buckets and overcrowding of the calves.

Parasitic or worm scours and coccidiosis, which is most often accompanied by blood clots and accounts for most blood scours, similarly can be prevented by sanitation and hygiene and can be checked by isolation and treatment at the first signs of infection.

These scours, which are very common, are spread by the droppings, so the heavier is the concentration of calves and the dirtier are the conditions the greater is the chance of infection being picked up. The paddocks become what is termed "calf sick", and the remedy then is clean, fresh calf paddocks yearly (if such paddocks must be used), clean feeds, feeding methods, and utensils, and, ideally, rotational grazing of the calves ahead of the cows.



KILL OPOSSUMS

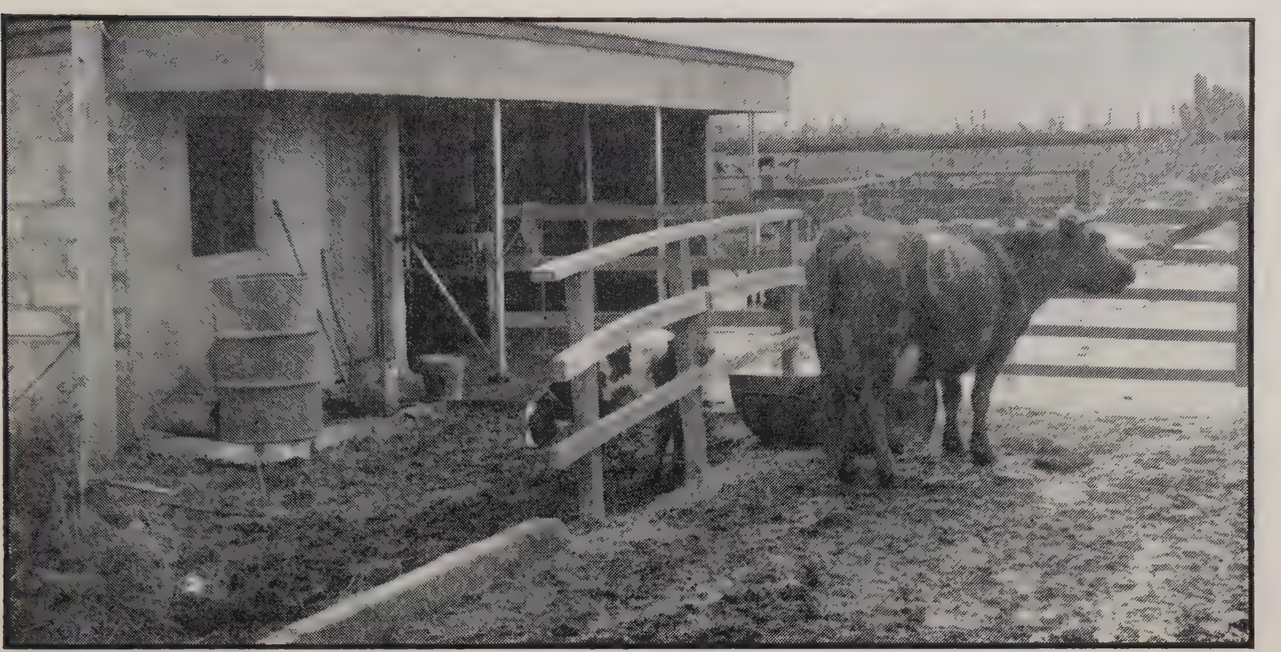
Opossum control is URGENT! To meet the threat of these pests, the Government is offering 2/6 for token skins (consisting of two ears continuing into a nine by two inch strip of back) or is guaranteeing a minimum floor price of 2/6 for all skins submitted to approved auction sales. Help wipe out this menace — and earn money at the same time.

Full details of the scheme are presented in a pamphlet which you can obtain by calling at or writing the following offices: Lands & Survey Dept., N.Z. Forest Service, City Councils, County Councils, Catchment Boards, Acclimatization Societies, Opossum Bounty Officer and local offices of Internal Affairs Department.

2/6

**bounty
for tokens
or
guaranteed
minimum
floor price
at auction**

Issued by the Wildlife Division, Internal Affairs Department.



Calves reared in conditions such as these cannot thrive.

Redwater in Calves

Clean conditions can help to eliminate the redwater in calves that has been found to be caused by an organism called leptospira, which, however, is slightly different from the more recently diagnosed leptospira in sheep. The urine is infective, particularly after the animal has apparently recovered, and calves under crowded conditions and in poor sanitation can easily pick up the germ from each other through the urine.

As pigs are thought to be carriers of the disease to calves, close association between the animals should be avoided. Frequent shifting of animals to fresh paddocks gives opportunity for infective material from excreta to die out on the paddocks just vacated.

Blackleg

Animals killed by blackleg, a disease which strikes suddenly and kills quickly, show very dark, gassy quarter muscles when cut for post-mortem examination, giving rise to another name for the disease, blackquarter. Important preventive measures are keeping young animals away from infected paddocks and diseased stock and vaccination. Dead animals and soil and material contaminated by discharges should immediately be burnt or buried deeply. Strict isolation of unaffected calves and preventive vaccination will greatly reduce the possibility of further losses.

A feeding shed in this state can contribute to the spread of disease.

BALER TWINE

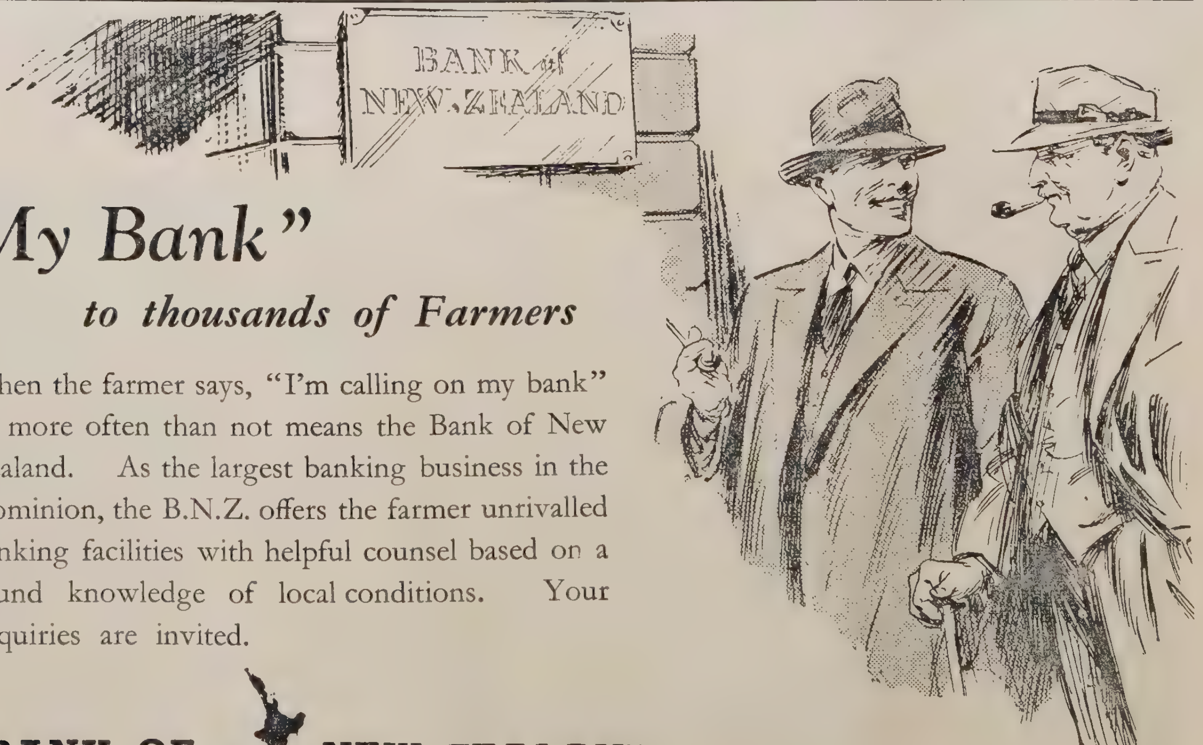
Order your season's requirements NOW!

Best quality full sisal English manufactured Twine. Specially treated and in one length per 20lb. Ball. 300lbs. Tensile strength and 225 feet per lb.

DORING

IMPLEMENT SUPPLIES LTD.

P.O. BOX 1179, WELLINGTON
P.O. BOX 548, PALMERSTON NORTH
P.O. BOX 632, HAMILTON.
P.O. BOX 1203, CHRISTCHURCH.
P.O. BOX 99, GORE.



"My Bank"

to thousands of Farmers

When the farmer says, "I'm calling on my bank" he more often than not means the Bank of New Zealand. As the largest banking business in the Dominion, the B.N.Z. offers the farmer unrivalled banking facilities with helpful counsel based on a sound knowledge of local conditions. Your enquiries are invited.

BANK OF NEW ZEALAND

More than 290 Branches and Agencies in the Dominion. Established 1861.

18.IC

Internal Parasites

Sheep are particularly susceptible to parasitic infestations. The money value of deaths or depreciation in lambs and hoggets every year as a result of worm infestations would reach a staggering total. Early in the spring of 1951, and also during the preceding autumn, instances occurred of 300 hoggets dying in a flock of 1000 because of stomach worms alone.

This enormous wastage can be prevented by better management and hygiene, rotational grazing, and early treatment of infested animals.

Docking

Extreme cleanliness must be enforced when lambs are being docked. Frequent disinfection of instruments and clean cuts are essential.

Docking methods which result in dead material being left to rot, such as occurs when rubber rings are used, are bad in that they provide potential breeding grounds for the bacteria of malignant oedema, tetanus, and arthritis.

Wounds

Any wounds in animals, particularly in young animals, should be kept as clean as possible. The organisms causing tetanus and blood poisoning are natural inhabitants of the bowel which, though they cause no harm in the bowel, will infect open wounds. An animal with a deep wound, especially if it was received in the vicinity of stables, cowsheds, or woolsheds, ideally should have an anti-tetanus injection and the wound well washed out with disinfectant. If deep wounds have to be stitched, care must be taken not to create an ill-drained pocket which will be ideal for the multiplication of bacteria. Hydrogen peroxide diluted with 2 to 4 parts of clean warm water is an effective antiseptic against organisms which can live only in the absence of oxygen, to which group the germs causing tetanus and blackleg belong. Of prime importance in wound treatment is good drainage, which is best achieved when the wound is left open.

Milk drunk by calves should be clean and wholesome. Suckling of cows with tuberculosis-infected udders can result in transmission of the disease to the calves.

Treatment of wounds should be on simple lines—a good syringing out with cold water or, better, boiled water, or with an acridine type of disinfectant, and a light dusting with a sulphonamide powder or penicillin. The sulphonamide must not be applied too thickly, as in lumps it is a foreign body and an irritant. Lacerated wounds, particularly those that are dirty, should be given particular attention in washing. Disinfectants are discussed later in this article.

A good method of docking lambs.

Milk-borne Diseases

If possible, calves should be given tuberculosis-free milk. That will obviate danger of such an occurrence as the recent condemnation of 8 of 11 8-month-old calves in one herd for tuberculosis; when slaughtered they showed infections of the intestines as a result of infected udders in some of the cows of the herd.

In no circumstances should milk from tuberculous cows be fed to pigs, as they are very susceptible to the bovine strain of tuberculosis. Returns from meatworks show far too high a proportion of gut and head infections in pigs slaughtered, and every endeavour should be made to reduce this incidence.

Hygiene in Pigs

Young pigs are probably as susceptible as any animals to infection, and extreme cleanliness is necessary in their housing and feeding. Pigs by nature are no dirtier than other animals, but the belief that any conditions are good enough for a pig is still held. Many piglet losses undoubtedly could be avoided by sound sanitation and frequent cleaning of sties and feeding places.

Necrotic ulcers should be treated early with a dusting of sulphanilamide powder after first being cleaned up by removal of dead tissue. Not only is an untreated ulcer repulsive to the eye, but it also causes pain to the animal and enables the organism to persist and spread to other pigs.

Uniform to the last drop . . .

Because it's the only LIQUID PHENOTHIAZINE that's double-processed to the exclusive Premier Products formula.

The exclusive double-process formula by which Phenzeen Plus is made ensures thorough, even dispersion of the worm-killing drug. So Phenzeen Plus pours freely to the last drop and under no condition does it settle hard. It's ready-mixed and perfectly mixed. Easily administered with the Phenzeen Plus Automatic Injector or Dub-Ell-Dose Pistol.

Elliotts

PHENZEEN PLUS

You can be assured of supplies for next season by booking your order NOW through your stock firm. Manufactured and distributed throughout New Zealand by

PREMIER PRODUCTS LTD.,
WELLINGTON.

NOW in a NEW HANDY SIZE

✱ DUROID *NEW* ½ ROLLS

3ft. Wide. 108 sq. ft.
Approximate weight:
2-ply—42lbs. per roll
3-ply—52lbs. per roll
HALF THE PRICE OF FULL ROLLS

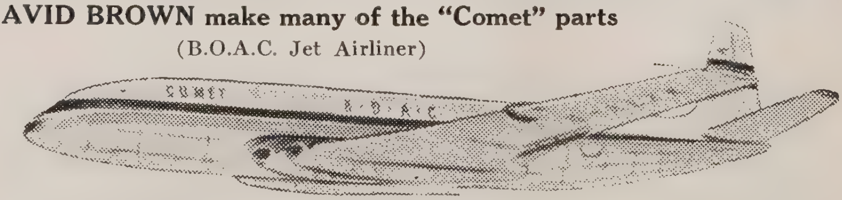
DUROID ROLL ROOFING is now available in convenient half rolls offering many advantages in ease of handling and ease of application. This special size has been produced to make your roofing work easier and faster. It's ideal for the handy man doing his own roofing, and especially for small jobs such as sheds and garages. For larger jobs it speeds up fixing and cuts out manhandling. Stocked by: Hardware Stores, Stock and Station Agents and Dairy Companies.

DUROID
ROLL ROOFING

DUROID WEATHER-PROOF

Sole N.Z. Distributors: **Dominion Sales Corporation Ltd.,**
Auckland - Wellington - Christchurch - Dunedin.

DAVID BROWN make many of the "Comet" parts
(B.O.A.C. Jet Airliner)



DAVID BROWN BUILD ONLY the BEST

DAVID BROWN make many of the parts for Britain's "Centurion", 50-ton wonder tank.

PETROL and DIESEL Engines.
N.Z. Distributors:
TODD BROS. LTD.,
WELLINGTON.
DEALERS EVERYWHERE.

Hygienic measures could reduce greatly expensive stock losses in adult animals such as that caused yearly by tuberculosis. The more concentrated is the farming and the heavier is the stocking the greater is the risk of spread of tuberculosis.

Hygienic measures for the control of tuberculosis include slaughter of all obviously infected cows which persistently cough and stand with their heads out, those that snore continually, particularly in the bails, and those that have large lumps on the body, especially high up on the back of the udder, in front of the shoulder or thigh, or immediately below the ear. That would reduce the concentration of bacteria, which can be spread either directly to other cows by inhalation, especially when they are in the yard, or indirectly on to pasture, hay, silage, turnips, and water, whence other animals can pick up the infection by ingestion.

Cows should not be fed in the bail if the herd includes such clinical cases, as the infection will spread quickly to the others through the feeding boxes. This method of spread is the most rapid of all, as has been found in tuberculosis testing of town-supply herds. Feeding boxes should be thoroughly cleaned out, scrubbed, and washed with disinfectant every day and left to dry in sunlight. Drinking troughs and stagnant pools are also possible sources of cross infection. Strong sunlight kills tuberculosis germs fairly quickly.

Cows suspected of being tuberculous must be promptly reported to an Inspector of Stock. Turning them out to die forms reservoirs of infection for wandering animals, especially pigs, which may eat the carcasses.

Fences should be inspected regularly for weaknesses to prevent mingling of stock from neighbouring properties, but even the fenceline cannot prevent a tuberculous cow from coughing over the pasture on the neighbour's side of the fence.

Tuberculosis in pigs should be watched for, as it is communicable to cows.

Early reporting of suspect cows is the best way to prevent spread of tuberculosis, as the longer the cows remain on the property, the greater are the chances of other cows becoming infected.

Johne's Disease

In general, the more insidious is the disease the less effective is hygiene in controlling it, and that is probably true of Johne's disease. Early slaughter of cows that are wasting away with a persistent frothy scour and of those with dropsy under the jaw in addition, especially in the more infected districts of Taranaki and Waikato, is sound hygiene. It will reduce the number of infective cows spreading the organism over pastures in droppings. Suspected cases of Johne's disease must be reported to an Inspector of Stock, who will have the animals slaughtered by a works and a definite diagnosis made—a similar procedure to that with tuberculous animals.

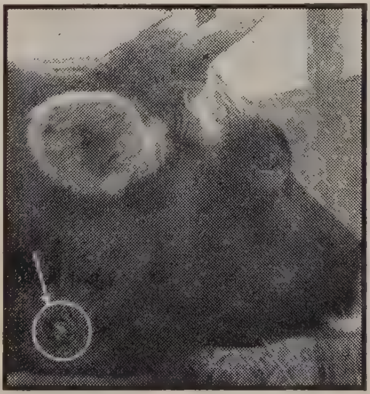
Mastitis

Penicillin cerate has proved effective for the control of some forms of mastitis, but it is not intended as a shield against dirty conditions causing infection in a herd.

Regular paring of sheep's feet is part of the programme for the elimination of foot-rot.

Water for washing teats should be clean and changed frequently. Dirty water is far too common in New Zealand milking sheds, as is the dirty tin of petroleum jelly. Germs will persist for long periods in an inert material such as petroleum jelly, so use of a lubricant from a tube is recommended. Changing teat-washing water frequently does not call for much effort; nor does washing the cups thoroughly after they have fallen off instead of giving them a wipe and putting them on again. These precautions amply repay the time spent on them.

Much reliance is placed on the small amount of disinfectant in a bucket of water, but, except for the recently marketed more potent materials, its disinfecting value is nearly nil except in far higher concentrations. The act of washing disposes of far more dirt and germs than does the disinfectant, which emphasises the importance of washing cows' teats thoroughly.



An open clinical case of tuberculosis in a cow. Because of the infection spread by pus from such an abscess affected animals like this one should be culled and condemned.

For cleaning the milk lines caustic soda at the rate of 1 teaspoon to 4 gallons of hot water is quite effective, but should be used only after a thorough flushing of the milk lines with cold water.

Disinfectants

Disinfectants are a much-abused commodity and much misapprehension exists about their use. The correct dilution to use is that recommended by the makers. Doubling the strength to make sure of results is dangerous, because too strong a disinfectant on a wound or in a douche causes great irritation and damage to the tissue. Nor should a solution be made too weak or kept until it is dirty in an endeavour to save expense and labour. A dirty solution has no germicidal value and may contain harmful spores which are resistant and could cause worse trouble.

Phenolic disinfectants are the common type with the typical smell associated with such solutions. They depend on the presence of phenol or carbolic acid to destroy bacteria. They do not destroy spores of germs causing blood poisoning or tetanus; nor do they affect the organism of tuberculosis in the usual strength. Solutions of phenolic disinfectants should be changed frequently.

Oxidising disinfectants such as condy's crystals (permanganate of potash), hypochlorite solutions (those which smell of chlorine), and hydrogen peroxide depend on the presence of fresh oxygen in a very active state and therefore should be made up afresh when they are to be used. Hydrogen peroxide at the correct strength causes bubbling in a deep wound and therefore, as well as killing many germs, carries other harmful spores out of the wound in the foam.

Iodine is a favoured antiseptic and is quite useful, but its value is lessened in the presence of water, such as occurs in weeping wounds.

Feeding raw offal to dogs helps to maintain the life cycle of the hydatid disease.

Methylated spirit and alcohol are best used at 70 per cent. strength, but are not very effective disinfectants, having no action on spores during the usual time of so-called sterilisation of skin or instruments.

Kerosene is not a disinfectant and is valueless, and Stockholm tar is fairly weak and must not be used where it will stain wool.

Quaternary ammonium compounds are generally useful disinfectants and will dissolve grease, allowing hidden organisms to be destroyed. These compounds are the disinfectants of choice.

Acridines and flavins are very good disinfectants, but their staining limits their use. Acriflavine is probably the best known and the cheapest. These disinfectants should be used in very dilute form.

Sulphonamides such as sulphanilamide powder are not true disinfectants. They must not be contaminated by organic material, as they do not destroy organisms; they act by interfering with the life processes of the bacteria, thus assisting the white cells of the blood to attack and destroy the invading bacteria.

Similarly, penicillin and other antibiotics are not true disinfectants and must be handled in a clean manner.

Boiling is the best method of disinfecting instruments and should be used wherever possible.

Milking-shed Hygiene

Cleanliness and care of the teat are important in dealing with cow pox and the so-called black pox. Black pox in particular presents a great problem on the farms where it occurs, and it is so persistent and so hard to eradicate that extreme cleanliness in treatment is of prime importance. Washing and scrubbing of bail doors, shed floors and walls, and leg ropes must be thorough.

Sterility

Knowledge of the bacteria causing sterility is incomplete, but *Brucella abortus* and trichomoniasis in cattle, *Vibrio foetus* in cattle and sheep, and recently a rickettsia-like infection in sheep are known to exist in New Zealand. Hygienic measures can reduce losses caused by these organisms, though probably not spectacularly. At least the farmer can do his best to isolate and treat promptly any animal with a vaginal discharge and can bury discharged material, thus limiting the spread of germs over the pasture or the passing of them on in coitus to the male and thence to other cows or ewes. Once sterility or abortion is present and the male is infected, the best course is to get rid of him and allow the females a period of rest in which to clear themselves of the infection before bringing in a clean, fresh bull or ram.

Foot-rot

Hygienic conditions and treatment can control foot-rot. Any damage to a cow's foot allows the organism to enter. Rough scoria and metal in gateways, barbed wire, tins, nails, and even hard, dry, rough ground can cause such damage. A bluestone bath at the cowshed or bluestone swabbing of the foot may help to control the infection. If not, one of the sulpha drugs or penicillin should be used.

The feet of sheep should be pared regularly and a bluestone bath used. As the germ will live for only about 10 days on the pasture, spelling a paddock for a fortnight after sheep have been on it is effective. These measures combined will eliminate foot-rot in sheep from any property if rigidly carried out. Bulletin No. 325, "Foot-rot in Sheep can be Eradicated", obtainable free from any office of the Department of Agriculture, explains the methods in detail.

External Parasites

Lice are extremely irritant parasites of stock which cause great loss of condition when the infestation becomes serious. Regular inspection is needed, but control is not difficult, as dipping of sheep is effective and oil treatment destroys lice on pigs. By law, sheep must be dipped annually. Not only does neglect of this measure make the farmer liable to prosecution, but heavy losses in wool and condition may be caused by serious attacks of parasites. An animal free from external parasites suffers no irritation, so it does not waste time in scratching and rubbing and has more time in which to feed contentedly.

Poisoning

The total loss from all forms of stock poisoning would not be extremely high, but poisonings are preventable, and in most instances cleaning up premises is the obvious hygienic precaution.

Not many poisonous plants occur naturally in New Zealand. Tutu and ngaio, however, are responsible for some deaths each year, especially when cattle are hungry, and deaths have been caused by rangiora, strathmore weed, bracken fern, goat's rue, variegated thistle, and celery-leaved buttercup, among others. Eating of wilted branches of macrocarpa can result in abortion in cows.

Some garden plants and trees, such as yews, oleanders, and rhododendrons, and occasionally noxious weeds such as ragwort, cause losses, but by far the most common cause of death by poisoning is lead poisoning resulting from licking old paint tins or discarded battery plates. Painted farm gates and yard rails may be dangerous for years after being painted.

Arsenical weedkillers are very dangerous if used carelessly, and production has fallen in cows grazing on recently topdressed paddocks, particularly when North African phosphate has been used.

Guarding against Infection

Some animal diseases are transmissible to man, so in all dealings with diseased livestock no precaution is too minute to observe. The main diseases which the farmer in New Zealand has to guard against are infections of wounds acquired in operations such as removal of retained afterbirth and from contact with contaminated soil, especially around sheep sheds and stables, staphylococcal and salmonella food poisoning, tuberculosis, tetanus from punctured wounds, leptospirosis from urine of infected calves, cow pox, scabby mouth, erysipeloid infection from pigs, and hydatids from dogs. The incidence of hydatids in New Zealand is one of the highest in the world, and every year about a hundred fresh cases are diagnosed, but the disease can be prevented by not feeding raw offal to dogs, by regular dosing of possibly infected dogs with arecoline hydrobromide, and by washing the hands regularly, especially before meals.

Good hygiene is a potent influence on the maintenance of animal health in New Zealand, and if farmers co-operate, the standard of hygiene throughout the country can be raised still further.

Types of Farming Practised in New Zealand

By W. N. PATON, Senior Investigational Officer, Department of Agriculture, Wellington

THE number of holdings in New Zealand according to the type of farming practised in 1950 and according to farming regions and to land districts are given by the Census and Statistics Department in a supplement accompanying the May 1952 issue of the "Monthly Abstract of Statistics". A World Census of Agriculture was conducted in 1950, and in meeting the requirements of such a Census not only are extra items covered to those included in the annual collection, but additional tabulation and analysis work is done on the data. Further tables will therefore be published by the Census and Statistics Department as this work proceeds, and brief summaries of this special information with explanatory comment will be published in the "Journal" from time to time. This article deals with the types of farming practised in New Zealand and the numbers of farms classified in each group.

OFFICERS of the Department of Agriculture drew up a basis by which the types and combinations of types of farming enterprises could be established and recorded for each holding from the data collected. Where 75 or more per cent. of the total farming effort on a holding concerned any one type of farming the farm was classed according to that type. If the enterprise involved two types of farming in combination, one at not less than the 50 per cent. level and the other at not less than the 25 per cent. level, the type of farming was recorded according to the combination represented, with the major one mentioned first. The proportions of each type of farming within mixed farming enterprises were determined by using factors based mainly on the standard labour requirement of the respective types of farming.

Holdings where a particular type of farming was carried on to the extent of 50 per cent. of the total or more (inclusive of those where the same main type of farming was carried on at the 75 per cent. level or more) have been combined into major groups according to the type of farming concerned. The numbers of holdings in these groups and other more miscellaneous groups in the North Island, South Island, and New Zealand as a whole are given in the table following. Data for the Chatham Islands have been included with the South Island, whereas the Census and Statistics Department have included these with the North Island. The numbers in the table represent all holdings of 1 acre or more (excluding those farmed by Maoris under the communal system) situated outside city and borough boundaries and in town districts comprising parts of counties within which they are situated.

NUMBERS OF HOLDINGS IN EACH FARMING GROUP

	North Island	South Island	New Zealand
Dairy group	33,262	6,505	39,767
Sheep group	12,092	11,172	23,264
Beef group	802	439	1,241
Poultry group	761	691	1,452
Horticulture group	2,422	2,193	4,615
Cropping group	293	2,495	2,788
Mixed farming group	427	1,307	1,734
Grazing group	2,240	1,754	3,994
Miscellaneous group	1,220	1,165	2,385
Unused and residential	4,764	4,286	9,050
Totals	58,283	32,007	90,290

The table above and those published by the Census and Statistics Department in the supplement to the May 1952 "Monthly Abstract of Statistics" give for the first time a really dependable and comprehensive indication of the relative popularity of various types of farming in New Zealand. Later as machine-analysed data are made available by the Census and Statistics Department concerning the main items covered in the collection a precise and valuable picture of the agriculture practised in New Zealand and of the locations and sizes of the farming patterns according to type will be gained. This information will facilitate the study of land-use problems, the collection of statistics by "master sample", farming surveys, and national and regional planning and development.

Heading photograph by V. C. Browne.

Analysis of Groups

The table clearly shows the importance of dairy and sheep farming in New Zealand, the two together accounting for 70 per cent. of the total holdings (dairy farming being 44 per cent. and sheep farming 26 per cent.). If residential and unused holdings are excluded, these two farming groups comprise 78 per cent. of New Zealand farms. Of the 81,000 holdings concerned with agriculture in some form or other to a significant extent approximately 10,000 are operated only part time. Unfortunately it is not possible at present to give any details of these.

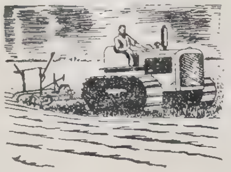
Dairy Group

The holdings in the dairy group comprise 44 per cent. of the total for the Dominion, 84 per cent. being in the North Island and 16 per cent. in the South Island. On 35,146 holdings dairying is carried on at the 75 per cent. level or more. Of the types where other forms of farming are carried on to a significant level (that is, 25 per cent. and more) together with dairying (at not less than the 50 per cent. level) only that of dairy and sheep farming is of appreciable importance, there being 2230 such holdings. There are 763 holdings where the raising of dairy heifers and other dry dairy stock is the main activity.

Sheep Farming Group

Of the 23,264 holdings in the sheep farming group 16,883 are concerned in sheep farming to a specialised extent, that is, 75 per cent. or more of total activities are devoted to sheep. Unfortunately no details were collected from farmers by which different types of specialised sheep farming could have been defined, and thus it is not possible to say just how many represented fat-lamb farming, how many store-sheep farming on hill country, how many wool-dominant sheep farming in the high country of the South Island, and how many other types of sheep farming. Important sub-types of sheep farming are represented by the following numbers of holdings: Sheep and beef 1731, sheep and dairy 1339, sheep and crops 1245, and sheep and mixed 1151. In the last sub-type mentioned sheep farming is carried on at not less than the 50 per cent. level together with two or more other types of farming none of which represents 25 per cent. or more by itself but which collectively represent 25 per cent. or more.

Arable Cropping Group



The arable cropping group consists of only those holdings where the major activity concerns cereal and seed cash cropping together with potato, onion, and other non-fodder crops but excluding horticultural operations proper. The term arable cropping has therefore been applied in a restricted sense. Almost 90 per cent. of these cropping holdings are situated in the South Island, and of the 2788 holdings, cropping predominates at the 75 per cent. level and more in 988 cases and grass-seed production in 249 cases. Cropping activities combined with a significant proportion of sheep farming occur in 955 cases, this being the only cropping sub-type of major importance occurring within the cropping group.

Beef Cattle Raising and Fattening

There are more holdings concerned in beef cattle raising and fattening than may have been realised, but a fair proportion of the holdings are conducted on a part-time basis. Grey and Westland Counties have a higher proportion of holdings devoted to beef cattle as a major activity than any other district in New Zealand, but 42 per cent. of them are worked on a part-time basis. Beef cattle raising and fattening is specialised to the 75 per cent. level and more in 952 cases (76.7 per cent.), and is conducted in conjunction with a significant proportion of sheep farming (that is, 25 per cent. and over) in 215 other cases.

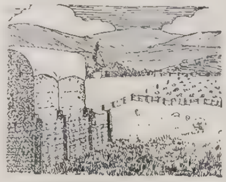
Poultry Group

The poultry group is incomplete because the numbers of poultry situated within city and borough boundaries are just as great if not greater than those in rural areas. The proportion of poultry farming in rural areas conducted at the 75 per cent. level and more is slightly less than 70 per cent. (69.4 per cent.), and the only sub-type of any consequence is where dairying is an adjunct to poultry farming (260 cases). In the dairy group there are 309 cases where poultry forms a significant adjunct to dairy farming. Many part-time poultry farming enterprises are included in the poultry group.

Horticultural Group

In the horticultural group there are 1449 orchards, 78 vineyards, 1448 market gardens mainly concerned in the raising of vegetables, 233 nurseries of all kinds, 227 holdings and 26 holdings concerned mainly with tobacco growing and hop gardening respectively, 132 apiaries, 138 small fruits holdings, 406 holdings devoted to other specialised horticulture (including mixed horticulture), 179 to horticulture and dairying, 62 to horticulture and poultry, 55 to horticulture and sheep, and 182 where horticultural and other non-horticultural activities are carried on at a significant level. Part-time agriculture plays an important role in this group also.

Mixed Farming Group



This group includes farms where three separate types of farming are worked in combination, each of the three being represented at the 25 per cent. level or more. Only farms on which no one type of farming can be represented at as high a level as 50 per cent. of the whole enterprise can be classified in this group. It is possible for four separate types of farming to be conducted on a holding at the 25 per cent. level (that is, each one at exactly this proportion of the whole), but such cases would be extremely rare.

Grazing Group

Holdings in the grazing group represent areas held or let for more or less casual grazing (2804), winter run-offs mainly for dairy herds (553), holding paddocks on stock - droving routes (342), stock dealers' lots (156), and sports, show, and race grounds and the like let for intermittent grazing (139).

Miscellaneous Group

The miscellaneous group is comprised of 274 holdings devoted to plantations, 22 to *Phormium tenax*, and 477 to horse raising, 227 pig farms, 75 areas of native timber where timber cutting is the main activity, and 1310 holdings devoted to other types of farming or agriculture not elsewhere specified. In this other agriculture sub-group are many holdings where agriculture was carried on only at the domestic requirements level, but which could not be allocated to the residential group because no people resided on the holdings. Many of these holdings were cow paddocks for household cows pertaining to a separate residential area.

Unused and Residential Group

The unused and residential group is comprised of 2340 unused holdings and 6710 residential holdings. Unused holdings were so grouped because no residents, no crops, and no stock were recorded for them. It signifies that no agricultural use is being made of such holdings, but it does not necessarily mean that they may not be devoted to some non-agricultural use such as a metal quarry or mining area. Residential holdings are those on which people reside but where agriculture is carried on at only the domestic requirements level.

The Home Garden in September

By C. L. NAPIER, Horticultural Instructor, Department of Agriculture, Hastings

WITH the sowing and planting of vegetable crops rapidly increasing as gardening conditions improve, gardeners no doubt will be wondering what results their efforts in soil improvement will bring forth later in the season. Liberal applications of organic matter are necessary if desirable growth is to be maintained. Besides improving the structure of soil, organic matter provides in varying amounts certain foods essential to plant health. However, because of its variable plant-food content, organic matter often requires to be supplemented with inorganic fertilisers.

FERTILISERS are applied to the soil for many reasons, the main one of which is to increase the yield of the crops grown. A second important reason is to encourage early maturity of crops. With commercial crops this would be an advantage if the crops could be marketed early. Coupled with this is the hastening of maturity either in early or main crops. With leafy crops particularly, quick maturity is essential if tenderness and good quality are expected. Other reasons are to increase the resistance of a crop to fungous diseases and to provide any mineral element known to be deficient and causing a nutritional disease of the crop concerned.

Fertilisers are manufactured or are natural materials containing certain plant foods in varying quantities. To be effective, plant foods should be available to various vegetable crops in certain ratios. Unfortunately, however, the optimum ratios are not known for all crops, and every type of soil can give different results even if the same amount of fertiliser is applied to each type. It is this last fact which makes it most difficult to give specific recommendations for New Zealand as a whole or even for one particular district.

Major Plant Foods

Nitrogen, phosphorus, and potassium are the major mineral elements necessary for plant growth; the remaining 60 or so are required in varying minor degrees. The majority of these are termed trace elements. The only other important element is calcium (lime), which also acts as a soil improver.

Nitrogen

Nitrogen is contained in manufactured fertilisers such as nitrate of soda, sulphate of ammonia, dried blood, and blood and bone. It is also contained in animal manures and in the nitrogen nodules on roots of legumes such as peas. Nitrogen is essential for vegetative growth and is therefore valuable for leafy crops such as spinach, lettuce, silver beet, and cabbage.

Because nitrogen generally becomes available fairly quickly, it should not be applied very long before it is required. This is particularly so with nitrate of soda and to a less extent with sulphate of ammonia, both of which are best applied when plants are growing. Sulphate of ammonia can, however, be applied immediately before sowing, as it remains in the soil for a period.

Phosphorus

Phosphorus is contained in bone fertilisers, the bone of blood and bone, superphosphate, and basic slag. Phosphorus tends to encourage early root development and is also valuable for seed, fruit, and flower development. As most New Zealand soils are low in phosphates, general application of them can usually be made with safety. As phosphates are not readily lost from most soils, they can be applied before growth begins and are therefore best applied as a base dressing at the time of soil preparation and before sowing and planting. Bone fertilisers, blood and bone, and superphosphate are the best phosphatic fertilisers for home garden use.

Potash

Potash, which is available in commercial preparations such as sulphate and muriate of potash and in wood ash, increases quality rather than quantity and produces sturdy growth as well as firm stems and flower stalks. It assists in improving weight, colour, and texture. Like phosphates, potash is not readily lost from normal soils and therefore can be applied early in the season. However, it does leach fairly readily from light, sandy soils. As it appears to be chiefly taken up early in the life of the plant, it is

---

Heading photograph by Sparrow Industrial Pictures Ltd.

NOW AVAILABLE

LIGHTNING

CONCRETE BLOCK MOULDS

Remember! One man in One Day with One **Lightning Block Mould** can make 100 or more Blocks to build that House, Garage, Shed, Barn, Outhouse or Retaining Wall (or Church, as was done by the congregation of St. James, Waimangaroa).

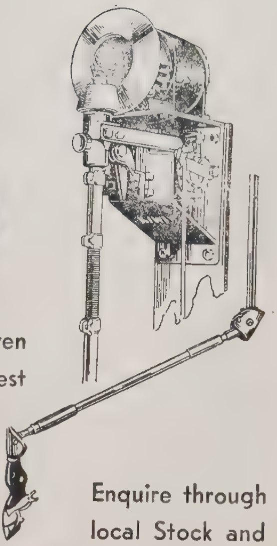
THERE IS NOW NO SHORTAGE OF CEMENT AND NO CONTROL.

Standard 18in. x 8in. x 6in. Price £12/17/6
Special 18in. x 8in. x 8in. Price £14/2/6.
Both complete with ornamental plates.
Railage paid nearest Railway Station.

Available from your Stock and Station Agent or Hardware Merchant or direct from the N.Z. Distributors:—

H. E. NAPIER LTD.
P.O. Box 1555, 5th Floor, D.I.C. Building,
WELLINGTON.

Descriptive pamphlet available on request.



SPEEDY — EFFICIENT

KIWI

SHEEP SHEARING MACHINE

ALSO AVAILABLE 'Portable' 'Midget' 'Standard' Models to suit your requirements.

Outstanding friction-driven model — fitted with best British motor — ball bearings throughout. Enquire NOW for further details.

Enquire through local Stock and Station Agent or direct to us.

KIWI SHEEP SHEARING MACHINES

NEW KIWI SHEARING MACHINE CO. LTD. 90 FEDERAL ST. AUCKLAND

SPEEDWAY

LOW & HIGH PRESSURE OIL BURNING BOILERS

Write for free illustrated catalogue to **Speedway Products Ltd.,** 26 Albert St., Auckland.
South Island Distributor:
A. H. Turnbull & Co. Ltd.,
Christchurch.

58-1-2

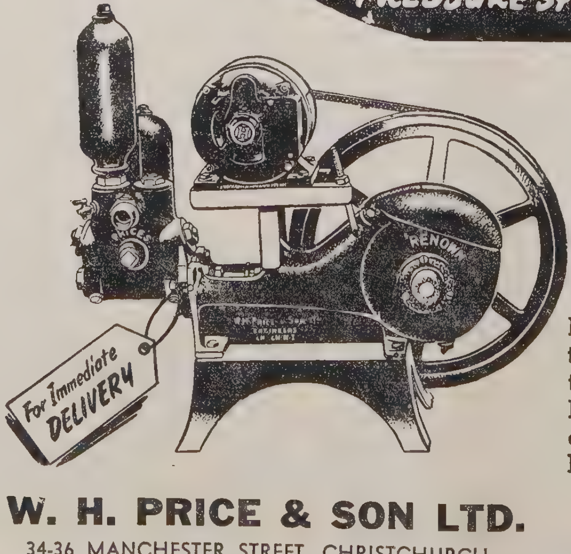
Proceedings of Ruakura Farmers' Conference

ANIMAL husbandry research is dealt with on a broad scale and presented in a clear and concise form in the "Proceedings of the Ruakura Farmers' Conference Week, 1952", published by the New Zealand Department of Agriculture. Of over 200 pages, the volume is a complete record of the papers and discussions on them at the conference. Dr. C. P. McMeekan, Superintendent, Ruakura Animal Research Station, directed the proceedings, which were conducted in co-operation with the Waikato Farmers' Educational Committee.

The book is available at 10s. a copy from the Ruakura Animal Research Station or from Publications Section, Department of Agriculture, Box 2298, Wellington.

The new Renown "350" shown below is silent, self-oiling, and tested and certified for performance and long life.

RENOWN PUMPS AND AUTOMATIC PRESSURE SYSTEMS



This model pumps 350 gallons per hour.

WRITE . . .
For Free Literature and information dealing with Renown Pumps and Automatic Pressure Systems.

W. H. PRICE & SON LTD.
34-36 MANCHESTER STREET, CHRISTCHURCH. P.O. Box 1084.

best applied with the phosphates in the base dressing.

Calcium

Calcium, the important portion of lime, is required by plants in the formation of their cellular structure. It also increases the activity of soil micro-organisms which assist in the breakdown of organic matter. It should, however, be applied judiciously, because excess lime will restrict the activity of micro-organisms and affect the growth of certain plants.

Value of Green Crops

Green crops alone do not introduce plant foods to any great extent. Apart from improving soil structure, their chief value lies in their ability to take up plant food from the soil which might otherwise be lost and release it for subsequent vegetable crops when the green crop is dug in later. In other words they are the means of carrying over remaining and easily lost plant foods from one season to the next. The most important element introduced with green cropping is nitrogen, produced in nodules on legumes such as peas, lupins, and beans. When these crops are broken down in the soil the nitrogen is released for future crops. On all soils where green crops are grown supplementary fertilisers will be nearly always necessary.

Animal Manures

If applied in sufficient quantities, manures from animals such as horses, sheep, and poultry are valuable suppliers of plant foods. Fowl manure is the richest and contains liberal quantities of nitrogen, phosphate, and potash. The amounts of animal manures applied should, however, be judged carefully, because if they are applied in excess, they can have disastrous results.

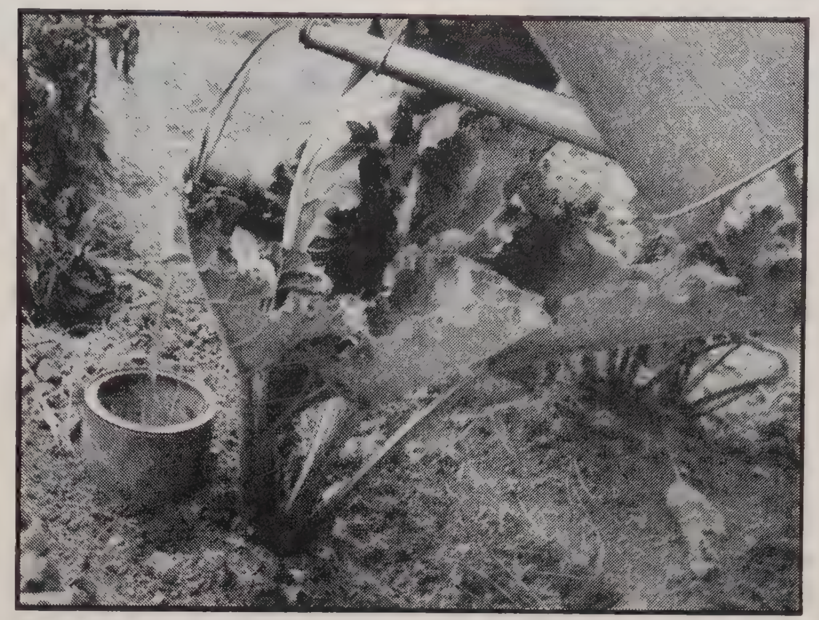
Animal manures are best utilised by mixing them with short straw, sawdust, or fine shavings. They give the most effective results if incorporated in the soil at least 8 weeks before the land is planted or sown. With crops such as carrots, parsnips, celery, peas, and beans the manures are best incorporated the previous season, when the initial release of plant foods can be used in raising leafy crops.

When animal manures are used extensively in the garden manufactured fertilisers should be applied with discretion, as over-feeding can result. The quantity and kind of manure used, the time when it is applied, the kind of crop, and the soil type should all be considered before the fertilisers are applied. Generally, though, light applications of phosphate and potash will tend to give a better balance.

Liquid Manures

Liquid manures are an efficient means of providing plant foods. One of their chief values is that nitrogen in particular is in solution and is quickly conveyed to the root zone. In this way it is often possible to obtain quicker results than from fertilisers applied to the soil surface in the dry form.

Soil should be moist and fairly loose before liquid manures are applied. A light forking before manure is applied will assist in getting the manure to where it is needed. Application of liquid manures should be governed by the stage and rate of growth, the season, and the type of crops being grown. For instance, vigorous leaf crops require greater quantities than slower-growing, fruiting crops. Applications during the cooler periods necessarily need to be lighter than those during the period when the flush of growth is to be expected, and the same lighter applications are necessary for seedlings.



[*Photo News Ltd. photo.*

Liquid manure can be applied easily to some crops such as rhubarb by inserting bottomless tins in the soil a little above the root zone. This arrangement is particularly valuable on sloping ground.

Liquid manure is usually of organic origin, being generally made from poultry, sheep, or horse manure. The first two are the best sources of food supply. Although liquid manures from these sources can be classed as complete manures, they cannot always be termed balanced ones, as the plant foods contained in them can vary a great deal.

Liquid manures are best made by putting the animal manure in an open-weave bag and suspending this in a drum or cask filled with water. When the solution is the colour of weak tea, say after 5 to 7 days, it should be ready for use. The water in the container can be replenished as each lot of liquid manure is drawn off, but replenishment should cease when the complete contents have been renewed about twice. This of course will depend partly on the quantity of manure originally suspended in the bag.

Nitrate of soda or sulphate of ammonia may be used as a liquid manure at a rate of up to 1oz. to 2 gallons of water.

Value of Home Production

The home vegetable garden presents a medium by which both pleasure and profit may be obtained. Most home gardening is probably done for the pleasure derived from it rather than from the profit motive, but there are times when necessity provides an impetus. Shortages in fresh vegetable supplies which occurred during the past season will have emphasised to many the value of production in the home garden.

Wise householders will therefore profit from experience and increase their efforts in the home garden, and if the effort is maintained through the season, they should reap the reward of tasty fresh vegetables and the pride of successful achievement.

Any spare ground should be used for vegetables as an insurance against possible shortages this season.

Types of Fertilisers

Fertilisers can be of three main types: Compounds, mixtures, or straight fertilisers. Compounds, such as blood and bone, contain more than one plant food in combination; in blood and bone they are nitrogen and phosphorus. In a mixture the number of plant foods can vary, as this type is usually made up for a particular purpose or crop, and although it may contain a compound fertiliser, it usually consists of a mixture of straight fertilisers such as sulphate of ammonia, superphosphate, and sulphate of potash. Mixtures are usually made up as balanced fertilisers; that is, the foods are in ratios as near as possible to those required by the crop. Some mixtures are recommended for a particular group of crops such as root or leaf crops; others are recommended for general application to gardens.

What to Apply

If organic matter, particularly animal manure, is applied in liberal

HERE'S WHY

POWER CULTIVATION

is faster, more profitable with a

ROTAVATOR

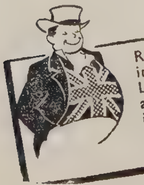
Gem

Differential lock reduces fatigue—There's no wrestling with a Rotavator "Gem". Differential ensures easier turning on corners and tricky headlands.

Complete control from all angles Handlebars of the "Gem" adjust both vertically and horizontally, allowing you to operate **from the side** without walking on cultivated soil. You can also work much closer to hedges, fences or rows of trees without danger of losing control.

3 forward speeds plus REVERSE—The gearbox of the "Gem" is the last word in **efficiency.** In addition to its 3 forward speeds, the "Gem" is fitted with **reverse** for increased manoeuvrability.

6 h.p. J.A.P. engine—Nearly the power of a small car! The specially adapted engine of the "Gem" is designed to pull like a draught horse on heavy soil or steep, difficult grades.



Rotavators are entirely made in England by Rotary Hoes Ltd. — largest manufacturers and exporters of rotary hoes in the British Commonwealth. Be sure you get a genuine Rotavator.

See your ROTAVATOR DEALER or write Rotavators Ltd., G.P.O. Box 705, Palmerston North.

Help the land fulfil its promise

—On the farmer's vision, initiative, skill and exertion depends the productivity of the land. Fulfilment of the farmer's plans also requires adequate finance and the National Bank is equipped to help by providing seasonal and short term finance for farming operations.

THE

NATIONAL BANK

OF NEW ZEALAND LIMITED

126 Branches and Agencies throughout New Zealand.

Help for the Dairy Farmer!

Glaxo Leadership in Penicillin Research and Production has produced a full range of

1. ***VETSPEN CERATE PENICILLIN UDDER INJECTION** — Contains a guaranteed dosage of 25,000 units of penicillin plus 10,000 extra units.
2. ***VETSPEN CERATE '50'** — Contains a guaranteed dosage of 50,000 units of penicillin plus 20,000 extra units. For more intensive applications.
3. ***VETSPEN CERATE '100'** — Contains a guaranteed dosage of 100,000 units of penicillin plus 40,000 extra units.

*Made with "prolonged action" **PROCAINE PENICILLIN** for greater efficiency.

VETSPEN CERATE
Penicillin
Udder Injections
for the defeat of
MASTITIS

Vetspen Cerate, Glaxo's Penicillin Udder Injection, is produced under rigid control in their Antibiotic Laboratories. For protection, every tube containing Vetspen Cerate is heat sterilised before packing, distinctly labelled and machine stamped with a serial number. The handy flat Vetspen Cerate tin containing 1 dozen tubes is date stamped with an "expiry date" to ensure that it reaches you with full activity.

Now available throughout New Zealand at the reduced price of 12/- per dozen tubes.

Always insist on Vetspen Cerate, the Glaxo Penicillin Udder Injection, and keep a tin available for use at the first sign of Mastitis (Mammitis) infection.

GLAXO LABORATORIES (N.Z.) LTD., Palmerston North

quantities, the amount of manufactured fertilisers applied can be less than would otherwise be the case. For general purposes in the home garden a base mixture consisting of nitrogen and phosphate is usually sufficient, but a light and occasional application of potash also will probably be beneficial. The base mixture is best applied to the garden plot during soil preparation before sowing or planting.

A suitable mixture for general purposes can consist of 3lb. of nitrogen, 5lb. of phosphoric acid, and 3lb. of potash. By mixing 7lb. of sulphate of ammonia, 21lb. of blood and bone, 14lb. of superphosphate, and 6lb. of sulphate of potash this ratio will be achieved; 1 to 2lb. of this mixture can be applied as a base to each 10 sq. yds. of garden and worked in before sowing or planting. Any of the mixture remaining is handy for applying to individual crops during the growing season.

[Sparrow Industrial Pictures Ltd. photo.

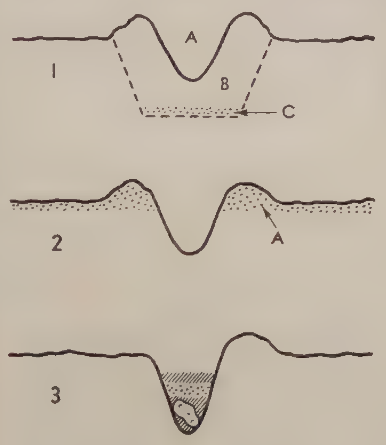
Band application of base fertiliser is more economical than broadcast application.

Side Dressings

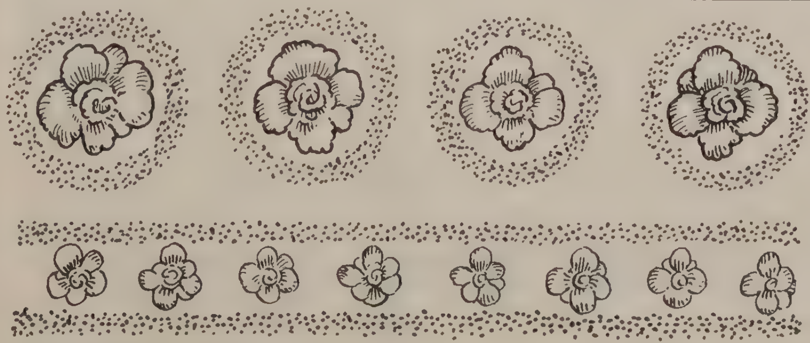
Application of fertilisers during the growing season is chiefly governed by the growth of the plants concerned. Individual fertilisers and not complete mixtures are often all that is necessary; this applies particularly to the leafy crops such as cabbage, spinach, silver beet, and lettuce. A few of the more common fertilisers and recommended amounts to apply as side or single dressings are as follows:—

Sulphate of ammonia supplies nitrogen and is soluble in water. It should be used at the rate of ½ to ¾oz. per square yard (1 sq. yd. is equal to 9 running feet of row 12in. wide). Sulphate of ammonia is valuable as a fairly quick-acting nitrogenous fertiliser for all leafy crops during the growing period. Its application to cabbages at the half-grown stage assists hearting. If the fertiliser is used from the seedling stage, several applications at 2- or 3-weekly intervals might be necessary. Liquid manure can be made by dissolving ½ to 1oz. in 2 gallons of water.

Nitrate of soda is soluble in water and is the quickest acting of the nitrogenous fertilisers. It also is valuable for leafy crops, particularly in the cooler periods, when it can be used directly without having to be converted by soil bacteria. As it goes directly into solution, it should be applied to actively growing crops only; otherwise its full value might be lost. Liquid manure can be made in the same way as with sulphate of ammonia.



At left—Distribution of fertiliser in three forms of band application. 1—Position of fertiliser in trench later filled and where the seed drill is drawn above the fertiliser level. A: Seed drill. B: Original trench. C: Fertiliser at bottom of original drill. 2—Surface application and fertiliser worked into surface before seed drill is drawn. A: Fertiliser incorporated in upper soil layer. 3—Potatoes can be covered with a light layer of soil, the fertiliser applied, and the remainder of the trench filled in.



Side dressing. Plants spaced widely can be manured individually; side band application is more suitable for plants growing close together.

Dried blood contains nitrogen in an insoluble form and requires to be broken down by bacteria before it becomes available to plants. It is considered a safe fertiliser, as it becomes available slowly. For this reason it can be applied to most crops where nitrogen is needed at up to ½lb. per square yard.

Blood and bone contains both nitrogen and phosphoric acid, both insoluble in water. Like dried blood it is organic and safe to apply to most crops at 2 to 4oz. per square yard. Organics should not be applied directly to root crops such as carrots in too liberal amounts.

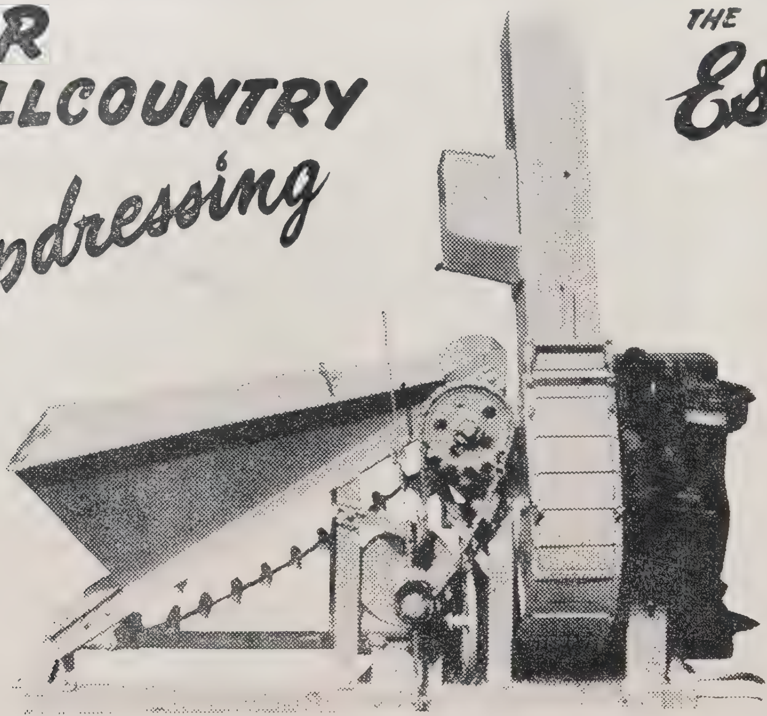
Phosphatic fertilisers such as superphosphate and the bone preparations generally become available slowly. They are valuable for root crops especially and can be applied at 1 to 3oz. per square yard.

Sulphate of potash should be used sparingly and best results are obtained when it is applied early. Its full value is not secured when it is used as a side dressing and it is therefore best applied in the base mixture. On most soils applications of up to 1oz. per square yard should be sufficient.

Muriate of potash can be applied at the same rate as sulphate of potash, but owing to its salt content it is best not to use it at heavy rates or continuously on all crops.

Applying Fertilisers

The most effective method of applying fertilisers has been the subject of research and trial for many years and various methods are still adopted in commercial practice. Under home



FOR HILLCOUNTRY *Topdressing*

THE ***Estcourt*** BLOWER TOPDRESSER

6 h.p. Motor.

Low hopper for easy loading.

Discharge funnel swings 180 degrees.

Seed box for over-sowing.

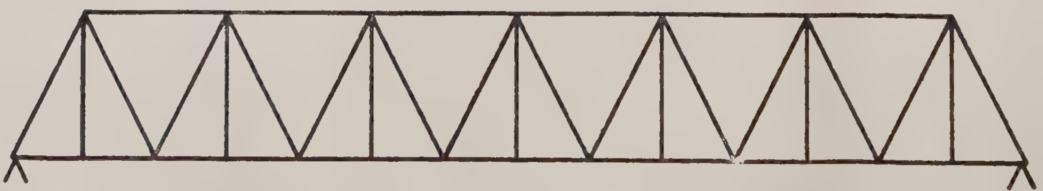
- SAVES TIME
- SAVES LABOUR
- CUTS COSTS

AVAILABLE EX-STOCK—WRITE FOR DESCRIPTIVE LEAFLET.

Distributors:
HODDER & TOLLEY LIMITED, P.O. Box 613, Palmerston North

FARM BRIDGES

CALLENDER-HAMILTON PRODUCTS



LIGHT GALVANISED STEEL TRUSSES — SPANS FROM 50ft. to 100ft.

Designed to carry a 12-ton vehicle, or stock loading up to 50lbs. per square foot, these bridges are most economical where long spans are needed.

FOR FURTHER PARTICULARS APPLY TO—

LUKE BROS. LTD.

P.O. BOX 1210 — TELEPHONE 54-635

92 CABLE STREET - - - - - - WELLINGTON

garden conditions, where cropping is fairly intensive, broadcasting of a general base mixture is perhaps the most satisfactory method. Where the different kinds of vegetables are usually grown in small quantities the application of special mixtures to each one is very difficult and perhaps not warranted. Fertiliser that is broadcast should be worked in well before sowing or planting begins.

Although broadcasting is the easiest method of applying fertilisers, band application along the line of the row is the most effective and economical. The garden line should first be laid out and the fertiliser then applied in a 12in. band along the line. The fertiliser can then be raked or lightly pricked in with a fork before sowing or planting.

Overseas experiments have shown that band application below the seed drill is the most effective method. In the home garden a deeper and wider drill than is necessary for sowing should first be made. The fertiliser can be spread along this and then soil returned to the drill. The seed drill can then be drawn to the required depth above the fertiliser level.

Although many gardeners sow fertiliser in the drill when sowing seed, this practice is unwise. This applies particularly to dried blood, blood and bone, sulphate of ammonia, and phosphatic and potassic fertilisers. In some instances germination can be checked almost completely and in others growth of young seedlings can be retarded seriously. Growth can be retarded for two reasons: First, the ammonia released during the breaking down of the nitrogenous fertilisers can kill the seeds; and secondly, the relatively high proportion of salts which pass into solution from some fertilisers causes plasmolysis, which in turn can kill the young plants in the seeds. It is therefore safer not to sow any fertilisers with seed.

Side dressings should not be made too close to growing plants, but at the same time should not be applied so far away that they will be ineffective. The placement should be judged mainly by the stage of growth of the plants, but in any case the fertiliser should not come in contact with stems and leaves. The most satisfactory method is to apply side dressings about each plant for widely spaced plants and in a band along each side of the row for close-growing plants.

[*Green and Hahn Photography Ltd. photo.*

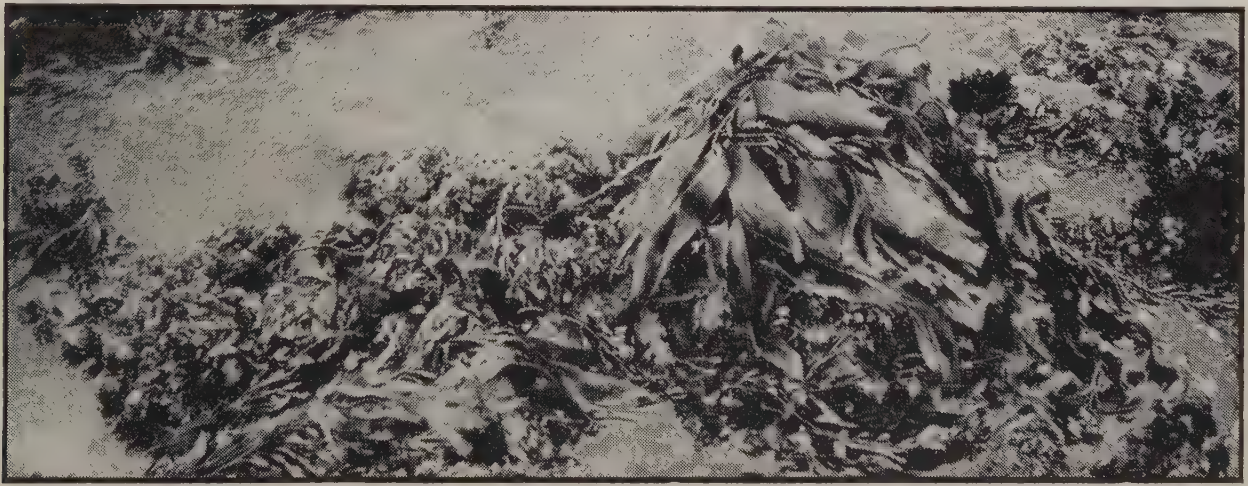
Soot is a good source of nitrogen and can be used for liquid manure either alone or with animal manure.

Where animal or other forms of organic matter are used during the growing season as a source of food they should be used carefully, as plant damage may result from careless application. Light applications in the form of a surface mulch can be made with comparative safety to leaf crops in general, celery, tomatoes, runner beans, asparagus, and rhubarb. As with fertilisers, animal manures should not come in direct contact with the growing plants.

Gardeners should appreciate that whatever fertilisers are used only supplement, and should not in any way take the place of, soil improvement by the application of organic material of plant or animal origin. A soil of good structure has many advantages among which is the important one of acting as a reservoir of plant nutrients and giving them up as required by the growing plant.

Other Work for September

The new season's activities are usually well under way during September, and in most districts at least some of the hardy vegetables may be sown. In heavy soils and in the colder districts soil conditions will not yet favour very widespread planting. If soil moisture appears to be excessive, gardeners should check drainage with



[*Green and Hahn Photography Ltd. photo.*

Besides providing valuable organic matter, seaweed is a good source of plant foods.

a view to having it improved as outlined in the May issue of the "Journal".

Where possible, all crops standing over winter and now past their best should be dug in or otherwise destroyed. This will assist in checking the carry-over of diseases and pests from one crop to the next.

If soil conditions permit, all vacant plots can be dug and any green crops turned in. Where possible, all spring crops should be cultivated to destroy winter weed growth and to open up the soil and assist drying out and warming up.

Planting out on ridges may still be necessary in cooler districts where soil conditions are unsuitable for planting on the flat.

Sowings

Beans: Dwarf and climbing varieties can be sown in the earlier northern districts. Medium loams with good levels of humus are suitable for beans. If late frosts are expected, sowings should be delayed. In southern districts broad beans can still be sown in soil that is well drained. Dwarf Gem is suitable and this variety can also be used for general planting when conditions become warmer and drier. Suitable varieties are:—

Dwarf: Sure Crop Wax (butter), The Prince, Masterpiece.

Climbing: Scarlet Runner and Fardenlosa.

Broad: Long Pod (early and hardy), Broad Windsor.

Beet: Both red and silver beet make satisfactory growth if sown this month. Sowings should be thin, but thinnings can be planted out. These will give a slightly later crop, thus extending the season.

Detroit Dark Red and Long Dark Blood are suitable varieties of beetroot and Giant Broad White Rib a good variety of silver beet.

Cabbage: In southern districts sowings of summer strains of cabbage can still be made. Seed can be sown in raised beds or under glass if conditions are not good. Best results will be obtained by sowing seed thinly in drills. Golden Acre and Copenhagen Market are good varieties.

Celery seed can be sown this month in most districts, preferably under glass if germination is to be satisfactory. Celery seed is very small and should therefore be sown as thinly as possible. Although Golden Self-blanching is the most popular variety, White Plume has a superior flavour.

Leek seed can now be sown in drills for next winter's supply. As plants can be harmed by undesirable soil conditions, sowing should be delayed if conditions are considered unsatisfactory.

Onions of main-crop varieties can now be sown where they are to mature, provided the soil is friable and not very cold or wet. Plants if sown thinly should need almost no thinning.

Spinach seed of the summer strains should be sown without delay if the soil is liable to dry out later in the season.

Lettuce seed can still be sown and Imperial 615 should be used where conditions are likely to be cool, or Great Lakes in soils which warm up rapidly and dry out.

Peas thrive best in cool weather, and best results will be obtained by sowing now, provided soil conditions are satisfactory. Early varieties are William Massey and Earlicrop; Greenfeast and Stratagem are suitable late varieties.

Plantings

Potato plantings of main-crop varieties should be attempted only in northern or other favourable districts. Many varieties can be recommended, but Aucklander Short Top for the North Island and Dakota for the South Island are good varieties. Cutting of potato tubers is a common practice among home gardeners, the main reason being economical use of the seed available. Some varieties appear to be unaffected by this practice, but Aucklander Short Top is one that does not give such good response. Although all the pieces of seed of this variety may grow, the subsequent crop is considerably lighter than when whole tubers are used. Government-certified seed should be bought where possible.

Cabbage and cauliflower seedlings now ready can be planted out. Planting distances need to be greater than for spring cabbage if the plants are to develop properly. A distance of from 18in. to 24in. should be allowed between plants and rows, the greater distance always being used for cauliflowers.

Tomato plants can be set out, but only in the most suitable localities where late frosts are not expected. Shelter should be considered where cold winds still play havoc until later in the year. Tomatoes should not be crowded, otherwise disease tends to become a problem and garden operations are difficult. Allow about 18in. between plants and at least 30in. between rows.

Herbs, rhubarb, and asparagus: It is not yet too late to plant out herbs such as sage, thyme, and mint and to plant up the newly formed asparagus and rhubarb beds. However, there should be no further delay, as growth should begin this month. If good roots are not available, it is best to leave planting until next season.

Other Tasks

Sow asparagus and rhubarb seed for next season's planting; cucumber, pumpkin, marrow, and celeriac under glass; and radish, cress, mustard, spring onions, turnips, and carrots.

Plant lettuce, onion, Jerusalem artichokes, and silver and spinach beet.

Hoe up early potatoes where necessary to protect them against the frost.

Construct fences for climbing beans, preferably before sowing, and drive stakes for tomatoes before setting out the plants. Broad beans may be subject to wind damage at this period and should be staked where necessary. All remaining winter root crops should be dug without further delay to avoid regrowth.

As temperatures gradually rise insect pests, including aphides will increase and the utmost vigilance is necessary if aphides in particular are to be kept in check.

Reference

"The Home Vegetable Garden", Department of Agriculture Bulletin No. 342, A. G. Kennelly, available at all offices of the Department for 2s. 6d. a copy.

BOOK REVIEW

"Principles of Milk Production": W. B. Nevens

THIS is the most recent text-book on dairying to come from the United States. It is intended primarily for the use of students in American agricultural colleges and for this purpose is an exceptionally well-prepared and well-presented account of modern knowledge. For the New Zealand student and dairy farmer, therefore, it has a limited usefulness, but it can be thoroughly recommended to anyone seeking to broaden his knowledge of dairy farming methods in the United States. In addition the sections on dairy cattle breeding, on milk secretion, and on the production of high-quality milk involve principles world wide in their application and these are of just as much importance to New Zealand dairy farmers as to producers in Professor Nevens's own country.

The nutrition of dairy cattle is treated extensively, naturally entirely from the European and American point of view. Much more scope is given to the use and value of pastures in dairy production than has been the case so far in the United States text-books. This is a reflection of the growing interest in pasture as the cheapest and best feed for dairy cattle as well as of the rapidly increasing costs of alternative feeds in most countries of the world, arising primarily from direct competition of humans for available concentrate materials. At the same time it is intriguing to read that "pasture is of little value to calves until they are more than six months old" and to see "rotational grazing" described as a system where paddocks are divided into four and each part is grazed for a week at a time. One gains the impression that the United States dairyman has little to teach the New Zealand farmer in the use of pastures for dairying. Of passing interest also is the recommendation that the treatment of mastitis should be undertaken only by an experienced veterinary practitioner. This will hardly appeal to the average New Zealand farmer.

On the economy side, stress is placed on the efficiency of high per cow productions, an aspect which will receive considerable criticism from many quarters in New Zealand, where per acre production tends to be regarded as the major criterion of efficient dairy farming.

The section on haymaking will interest many, particularly recommendations for forced ventilation and artificial drying in producing better-quality hay. Silage making recommendations apply mostly to special silage crops. On the making of grass silage emphasis is on the difficulties, and few practical recommendations are made which might assist in overcoming problems with which the New Zealand dairy farmer is so familiar.

The book is likely to be of interest more to the student than to the practising dairy farmer in this country.

—*C. P. McM.*

McGraw-Hill Publishing Co., Aldwych House, London. 40s.

The Basis of Disease Prevention on the Poultry Farm

THE effect of environment on the healthy bird constitutes the main theme of this series of articles on disease control on the poultry farm by J. J. Thompson, Veterinarian, Department of Agriculture, Wellington. This is the second article, the first having appeared in the May issue of the "Journal". The role of poor husbandry, inadequate housing, deficient diet, and lack of sanitation or hygiene as the predisposing factors to mortality in the flock cannot be too strongly emphasised.

Free range is invaluable for growing pullets. The range houses must be properly spaced to avoid overcrowding.

WITH a few notable exceptions, poultry diseases do not respond well to drug treatment, and in many instances it is not considered economic to treat an affected batch or even flock of birds. It is of extreme importance to the poultry farmer, therefore, that he should provide conditions for his flock which will prevent outbreaks of disease.

Discussion of each stage in the life of the flock in serial fashion serves to underline its dependence on the previous stage. In the first article the influence of the breeding bird on health or constitution was indicated briefly. Hatching eggs of normal shell appearance may all look alike externally, but deficiencies of the breeding stock's diet will be revealed during hatching or later in the brooder. An abnormal number of "dead-in-shell" may arise from lack of riboflavin or manganese in the maternal diet. Certain vitamins are passed on to the chick from the hen. Vitamin A plays an important part in the resistance of the chick to disease, and it is well established that the supply of this vitamin in the hen's feed provides the chick with a sufficient amount until it is able to store it up in the liver from the feed.

Obscure losses, leg weakness, and lack of resistance to other diseases are common in chicks deprived of the vitamin A which is normally passed on by the breeding bird.

Incubator Hygiene

The standard of hygiene in incubator rooms is generally fairly high in New Zealand. Unfortunately incubator rooms otherwise well kept are sometimes spoilt by careless habits. Storage of chick boxes, especially those which have been used previously, feed bags, or other material in an incubator room is bad practice. The room should be kept clear of all but essential equipment. Boxes, bags, or extraneous materials tend to gather dust which may convey infection to the incubator. To have used chick boxes, which may be contaminated with droppings and down, in the room is obviously inconsistent with elementary hygiene. Outbreaks of navel ill or pullorum disease may follow carelessness of this type.

Care of the Incubator

The need for a high standard of hygiene in the incubator is well known to most breeders. Between hatches particularly, the compartment trays and equipment must be cleaned thoroughly. A useful practice which may be adopted before any of the accumulated dirt is removed is fumigation of the hatching chamber with formaldehyde gas. This reduces the contamination of the brooder house by killing off large numbers of harmful bacteria which may be present in the chamber. Another useful method which may be applied is the removal of fluff and light debris with a vacuum cleaner.

The next step is the removal of trays. These may be placed in a large tank and washed thoroughly. It is not good practice to plunge them into a bath of disinfectant solution and leave them to soak, as most disinfectants are rendered useless by the presence of dirt. Trays should be scrubbed thoroughly with a hot 5 per cent. washing soda solution (1lb. to 2 gallons of water) or a ½ per cent. solution of caustic soda (1lb. to 20 gallons of water) after as much of the dirt as possible has been scraped off. After being cleaned in this way equipment should be disinfected with a reliable disinfectant according to the manufacturers' directions. The incubator should also be washed and disinfected in the same way and then fumigated.

A number of producers now use steam plant for cleaning and disinfecting equipment, which gives excellent results.

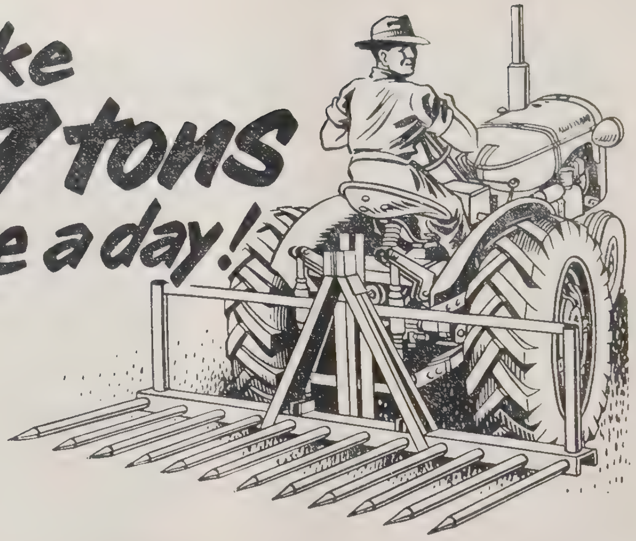
Fumigation

Formaldehyde gas generated by the interaction of potassium permanganate and formalin is the most effective and practical agent for the fumigation of incubators. Good results can be obtained only with high temperature and humidity in the incubator. The temperature should be 100 degrees F. and the wet-bulb reading between 85 degrees and 95 degrees. Fumigation in an atmosphere below 60 per cent. relative humidity is of very doubtful value.

The cubic capacity of the incubator chamber is measured in the usual way and the amount of chemicals used per 100 cub. ft. is 35 c.c. (1¼ fl. oz.) of formalin to 17.5 gms. (1oz.) of potassium permanganate. The latter chemical is placed in an earthenware or enamel plate or dish big enough to allow for the foaming up which takes place. It should be placed above floor level in the chamber and the formalin poured over it and the doors and ventilation ports closed immediately to allow the gas to penetrate to all parts. The chamber should be closed for at least 15 minutes, after which the ventilation ports may be opened.

The amount of chemical recommended is for normal use during incubation or hatching. Between hatches, when the incubator is empty, up to four times the amount should be used for thorough penetration of the machine. The use of the stronger mixture is of special value if infection has occurred in a previous hatch. Fumigation helps to control spread of disease in the incubator, but it has no effect on infection in the egg itself. The germs of pullorum disease, which may be passed through the egg, will not be affected by the gas. Elimination of carriers from the breeding stock by use of the blood test is the only effective way of dealing with egg transmission. Infection conveyed on the outside of the shell through contamination with droppings is controlled and may be eliminated by adequate fumigation.

One man and the PATERSON BUCKRAKE make 37 tons of Silage a day!



This versatile hydraulic tractor attachment mechanises Silage making, speeds up output, eliminates man handling, loads transports and dumps, in pit, on clamp, or for stack, and all at the touch of a lever. Single handed one man has made 37 tons in one day. Crops, heavy or light, tangled or straight, the Paterson takes them in its stride. Year round lift and shift jobs made easy. Place your order with your nearest Dealer listed below:—

Paterson Buckrake picks up . . .

Lifts and shifts 5 to 8cwt. Twelve tubular steel tines with a spread of 8ft. 7in. as illustrated right. Picks up cleanly. Trip mechanism enables dropping of load where wanted without stopping.

N.Z. Distributors

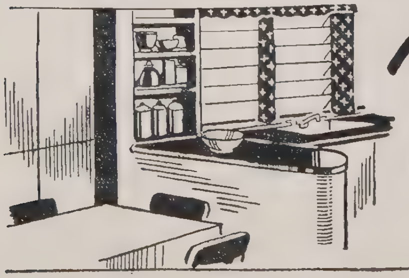
RELIABLE SERVICE EVERYWHERE

ANDREWS & BEAVEN LTD

Head Office: Moorhouse Avenue, Christchurch. P.O. Box 138.
Branches: Auckland (P.O. Box 2528), Wellington (P.O. Box 1868), Ashburton (P.O. Box 17), Timaru (P.O. Box 145), Invercargill (P.O. Box 5).

North Island Agents: James & Whimp Ltd., Whangarei. D. S. Mitchell Ltd., Tauranga. Bayliss & Booth Ltd., Te Puke. Dave Wilson (Whakatane) Ltd., Whakatane. Auckland Farmers' Union Co-op Soc. Ltd., Auckland. Newton King Ltd., Hamilton (Waikato). H. S. Motors Ltd., Gisborne. Wanganui Machinery Exchange Co. Ltd., Wanganui. Bull & Hodgins Ltd., Hastings. Manawatu Machinery Exchange Co. Ltd., Palmerston North. Masson Implement Co. Ltd., Carterton. Newton King Ltd., New Plymouth (Taranaki).

South Island Agents: W. G. G. Cuddon Ltd., Blenheim. W. G. G. Cuddon Ltd., Kaikoura. West Coast Agencies Ltd., Greymouth. Ernest Reid & Co. Ltd., Oamaru. Donald Reid & Co. Ltd., Dunedin.



NOW IS THE TIME TO RENOVATE YOUR HOME

with these outstanding WINSTONE LTD *lines!*

the new PERFECTED LOUVRE WINDOW

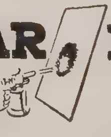
AGCO

SUPA LUVRES

WITH DETACHABLE CLIP ON FLY-SCREEN *available for* IMMEDIATE DELIVERY

FOR INTERIOR WALLS AND CEILINGS . . .

GIBRALTAR BOARD



FIRE-SAFE WALLBOARD

6ft., 7ft., 8ft., 8ft. 6in., 9ft. and 10ft lengths
WIDTHS 3 FT. and 4 FT

IMMEDIATE DELIVERY
ORDER NOW!

WINSTONE LTD

69-77 Queen Street, Auckland. Branches throughout New Zealand.

Messrs. Winstone Ltd., Box 395, Auckland.
Please send me full information on
- GIBRALTAR BOARD
- SUPA LUVRES

(Cross out item which does not apply.)

NAME ....

ADDRESS .... J.A.

Hatching eggs may be fumigated safely at any period except during the 24th to the 96th hour of incubation.

If hatching chicks are to be treated, fumigation should be done before the chicks are dried off. Provided there is no evidence of pullorum or navel ill in the hatching, good results may be obtained by carrying out the process at 18 to 20 days and again when the machine is empty.

Chick Boxes

Boxes used for transport of chicks should be used only once, but if they are to be used more than once, they may be cleaned and fumigated with formaldehyde in the incubator chamber or in a gas-tight compartment.

Rearing of Chicks

Management faults which give rise to chilling, overheating, damp litter, and poor ventilation not only themselves cause loss but will greatly increase mortality where infectious diseases such as coccidiosis or pullorum are present.

Chilling and Overheating

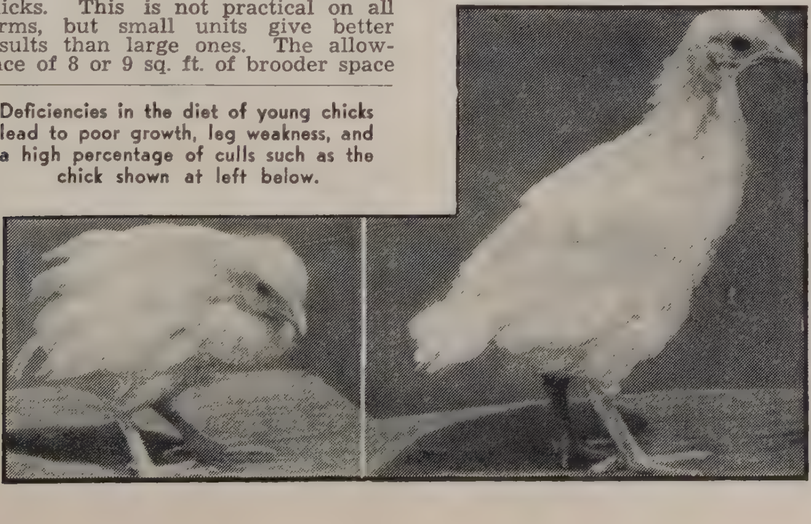
Chilling and overheating are common sources of loss arising from fluctuating temperature in the brooder. Floor draughts must be eliminated, but good ventilation is essential. It is bad practice to cut down the supply of fresh air to raise the temperature of the brooder. If more heat is required, the brooder should be run at a higher temperature. The comfort and appearance of the batch of chicks should be kept under observation constantly. This provides a better indication of the right conditions than strict adherence to maintenance of a certain temperature under the brooder.

Overcrowding

Overcrowding is such a well-known fault that it would appear superfluous to mention it. Beginners who fail to realise that the rapid growth of chicks requires expansion of brooder space can err understandably in this direction, but many experienced men allow overcrowding to occur through lack of foresight and planning for the necessary extra space required.

The number of chicks per unit varies, but the ideal unit is one of 100 chicks. This is not practical on all farms, but small units give better results than large ones. The allowance of 8 or 9 sq. ft. of brooder space per 100 chicks at the day-old stage is sufficient only for 40 to 50 chicks by 6 weeks because of the increase in growth. Overcrowding leads to damp litter, overheating, and sweating among the chicks. The damp litter encourages the survival of coccidia and worm eggs passed out in the droppings. If one pen suffers from an outbreak of coccidiosis, the damp litter clinging to the poultry farmer's boots is carried into other pens and spreads infection. Free air circulation under the brooder is required, and for this purpose wire frames are very useful. If wire frames are not used, careful raking of the litter will help to eliminate damp areas.

Deficiencies in the diet of young chicks lead to poor growth, leg weakness, and a high percentage of culls such as the chick shown at left below.



The addition of hydrated lime to the litter will also help to keep it in good condition. The amount used is 10lb. per 100 sq. ft. of litter. It should be stirred into the litter so that the chicks do not come into direct contact with it.

Chicks brooded on the floor gradually acquire immunity to coccidiosis by the small numbers of coccidia picked up from the litter when feeding. If the litter is allowed to become damp, the number of these parasites which survive under this favourable condition is greatly increased, and chicks instead of gradually gaining immunity are overwhelmed, with a resultant outbreak of the disease. Battery-reared chicks do not have the opportunity of acquiring immunity because of lack of contact with litter. For this reason chicks reared in batteries have little resistance when shifted on to range, and unless the ground used for rearing is clean, an outbreak of coccidiosis is likely.

Rearing in Isolation

Leucosis in its various forms is the predominant cause of loss in the poultry industry. Few practical safeguards against infection are available. One of the most effective ways of reducing losses is to segregate chicks from adult birds. Although the symptoms of leucosis do not become obvious until birds are near the laying stage, infection is contracted during the first few weeks of life.

Every endeavour should be made to rear chicks completely away from adults. The distance between the houses for adults and the brooder house is important. The further they are separated the more successful are the results; for example, a distance of 200ft. is vastly superior to 40ft. If this isolation can be maintained from the hatching stage until chicks are at least 3 weeks old, the incidence of leucosis can be much reduced in most flocks.

Any abnormal loss should be investigated. Post-mortem examination is usually necessary for accurate diagnosis.

Sanitation and Hygiene

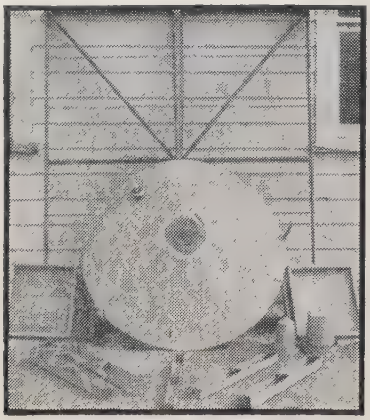
Most diseases are spread through droppings or other discharges. Contaminated food or water and damp litter are the usual media.

Before use the brooder house should be cleaned thoroughly and disinfected. Preliminary scraping to remove caked dirt should be followed by efficient washing with a 5 per cent. hot washing soda solution. The house should then be washed or sprayed with a reliable disinfectant.

Feeding troughs and drinking vessels must be kept clean. Drinking vessels should be placed on wire frames to eliminate wetting of the litter by spilt water.

Brooder Runs

A little run attached to the brooder house is extremely useful for exercising the chicks and giving them access to sunshine. Such runs, however, should be used only for one batch of chicks. If successive batches of chicks are allowed to use the same run, the contaminated ground, especially near the house, may give rise to an outbreak of coccidiosis. A run on each side of the house or alternatively on all four sides allows each run to be given a cleaning-up spell before use again.



Equipment should be cleaned and disinfected well in advance of the time it is required.

The grass in chick runs must always be kept short. Long grass is dangerous to chicks, which may be chilled when conditions are wet. Again, long grass provides excellent conditions for the perpetuation of worms and coccidia by protecting these parasites from the drying action of sunshine and wind.

Culling

Culling of birds which mope in corners, appear dull and off feed, or show evidence of diarrhoea reduces the risk of spread of disease, allows more space for healthy chicks, and saves money on feed. If the number which require to be culled appears excessive, a number of chicks should be dispatched for laboratory examination to the Department of Agriculture Animal Research Station, Wallaceville, with a full history of the numbers lost and the symptoms observed.

Feeding

On many poultry farms the diet of young chicks is consistently low in protein. The young chick is unable to accommodate bulky food and it requires a concentrated type of mash. The protein content of the diet should be not less than 18 to 20 per cent. up to the age of 8 weeks, after which it should be reduced gradually. As the amount of grain fed is increased the protein content of the mash must be built up to compensate for the lower amount of protein in the grain. The inclusion of 5 to 8 per cent. of milk powder is advisable. Buttermilk powder and skimmed milk powder contain good-quality, well balanced protein and also supply riboflavin, which is essential for chick growth. Fish liver oils containing vitamins A and D should also be used. Vitamin A is required for growth and disease resistance; vitamin D is essential for growth and for the body to utilise calcium and phosphorus in bone formation; lack of it will lead to rickets in young stock. Most of the other trace elements required are amply supplied by the standard chick mash in general use. Greenfeed is a valuable source of many obscure trace elements and of vitamins and should be used at an early age. Only the best should be fed, however, since the chick's crop will rapidly become impacted if greenfeed is fibrous and tough.

Feeding Space

Apparently obscure cases of chick mortality or poor condition are sometimes due to starvation. Lack of feeding space or badly constructed feed troughs can cause very young chicks to starve because of their inability to reach the food. Overcrowding or mixing chicks of different ages may lead to the weaker birds being pushed aside at feeding times.

Both feeding and drinking vessels must be constructed to prevent contamination of the feed and water as far as possible.

Rearing on Range

A number of essential principles must be followed for successful rearing of disease-free birds on range. The ground used should be clean and not have been used since the previous season at least. The space available must be adequate to obviate overcrowding, and the grass should be kept short by cropping or mowing. Good drainage and provision of shelter from prevailing wind are essential, though the shelter should not be so extensive that it prevents birds from benefiting from sunshine. Where natural shelter belts are not available brushwood fences may be built.

Many outbreaks of duodenal coccidiosis and heavy worm infestation are due to neglect of these principles.

Housing on Range

Range shelters are common in New Zealand and give good results, although they remain in the same place throughout the season. The area around the shelter, however, may rapidly become heavily contaminated, because the birds tend to scratch around that part and to shelter under the eaves from sunshine or wind. The danger is increased by the formation of pools of water formed by drips from the roof during wet periods. These pools of contaminated water, from which the birds may drink, can be responsible for spread of disease.

One method of eliminating this contaminated area is to cover a few feet on all sides of the shelter with wire netting or a layer of gravel confined by wooden edgings. The gravel will provide good drainage and remain clean throughout the rearing period. Rain washes the droppings down through the gravel.

Outbreaks of colds causing a severe setback are a common result of overcrowding or poor ventilation in the range house.

Sanitation and Hygiene

Red mite may easily become established in range shelters in numbers sufficient to cause damage to the young birds before it is observed. Before range shelters are put into use they should be cleaned thoroughly and disinfected. To prevent red mite infestation the house should be sprayed with a good insecticide such as 2 per cent. D.D.T. water suspension or a benzene hexachloride solution. Both these chemicals have a residual or lasting property and are much more effective for this purpose than creosote.

Feeding of Birds on Range

When birds are of 8 weeks old the high protein content of the diet should be reduced gradually over a period of 2 weeks. Normally the birds are changed to a different type of mash and milk powder is not fed. The feed should still contain at least 3 per cent. of animal protein. In many instances the birds are raised solely on a No. 2 standard mash, which has only vegetable protein. This is insufficient to maintain normal rate of growth.

The total protein of the ration required is 14 to 15 per cent., of which at least 3 per cent. should be from an animal protein source, such as meat meal. A useful ration which may be used is No. 1 standard laying mash with an added 10 per cent. of meat meal. This mash is fed with an equal amount of grain and the resultant level of protein intake is 14 to 15 per cent.

Vitamin A

Although at first it appears difficult to believe that vitamin A deficiency or greenfeed shortage can occur on open range, it is common. From January onward, sometimes earlier, pasture begins to dry up in many parts of the country. The dry, fibrous grass which results is of no value to poultry, and consequently deficiency of vitamin A will arise unless the birds receive a supplementary feed of good greenfeed. It may be necessary to use irrigation to obtain this or to grow special greenfeed crops of silver beet, cabbage, etc. If the supply is poor, the mash or grain ration should have a fish liver oil added to it. Many commercial producers add fish liver oil as well as supplementing with greenfeed.

Deficiency of vitamin A at the growing stage inhibits growth and increases susceptibility to infection or parasitic diseases.

Rearing young stock successfully with a minimum of loss calls for exercise of common sense and careful thought. Each step should be planned ahead in good time before the producer is involved in the rush of hatching and rearing. It is well worth while attempting to estimate the number of chicks to be reared and planning the brooder house arrangements accordingly. This would include not only the initial placing of chicks under a brooder, but how they are to be accommodated as they grow and require more room. Range accommodation, feeding arrangements, and measures of sanitation and hygiene can be discussed only in general terms. Each poultry farmer, having noted the factors essential to disease-free rearing, must then apply them to his own farm and flock in particular detail. Indeed, it is well worth his while to plan it out roughly on paper and think it over as he goes about the routine tasks on the farm. By so planning he is able to handle the daily problems which tend to interfere with his general plan.

The successful rearer of chicks must be efficient in the details which matter and be able to recognise faults which have occurred in previous years' work. If he finds difficulty in locating faults or in solving problems, he can ask the local Poultry Instructor to assist in improving the efficiency of his farm. Even the most efficient producer will benefit from informed, constructive criticism of his plant and methods of working it.

Philadelphus (Mock orange)

Luculia gratissima

Scented Shrubs

SHRUBS which provide colour and scent during the dull, cold days of winter are welcome additions to any garden. In this article M. J. Lockie, Horticultural Instructor, Department of Agriculture, Auckland, describes scented shrubs of good garden merit and advises on their culture. Many of these shrubs are particularly useful in that their flowering season occurs during winter, when colour in the garden is at a low ebb.

NATURAL fragrance is present in the petals of many flowers, but it occurs in other plant parts as well; for example, the rhizome of ginger, the seed of nutmeg, and the leaves of lavender and rosemary. Few flowers create such all-round interest as daphne and boronia and the reason for their popularity is their perfume. Whether outside in the garden or picked for indoor decoration, scented shrubs are firm favourites, and a further good point is that many of them choose winter for their period of flowering.

Adenandra fragrans from South Africa is a low-growing, spreading evergreen shrub usually remaining at a height of 2½ft. It bears large numbers of deep pink, wide-open flowers over the greater part of the year. Flowering begins in late winter, builds up to cover the bush with colour in spring, and gradually ceases in summer. Frosts are definitely harmful, but in a hot, sunny position on a hard bank or by a wall in a light, well-drained sandy soil *Adenandra fragrans* is an excellent subject. *Adenandra uniflora* is better known, but the flowers are paler, white-flushed pink, and the blooms, which are produced singly, are much larger. No pruning is necessary and both species last well when used as cut flowers.

Azara microphylla is a handsome evergreen tree from Chile, but is suitable only for mild districts. Growing to a height of 12ft. it has a good natural shape and makes an attractive specimen tree. The flowers are strongly scented with chocolate and although they are insignificant in themselves their scent can be appreciated from quite a distance. *Azara lanceolata* is a more colourful species with larger leaves and flowers. It does not grow as high, or have such a strong scent, as *Azara microphylla*, but the flowers are like golden balls set under the leaves. Both these shrubs do well in any well-drained garden soil; pruning to maintain good shape is all that is necessary.

Boronias

Boronia megastigma and *Boronia megastigma* var. *lutea*, the brown and yellow varieties of boronia, are well-known Australian shrubs. Their life span is only a few years, but they produce prolific crops of flowers. They do best in a soil rich in organic matter in the form of peat, leaf mould, or compost and in a sheltered situation with partial shade. A light mulch of lawn clippings in summer helps to keep them thriving. Flowers should not be picked so heavily that the bush is defoliated. After they have flowered half the new season's growth should be pruned back. This attention maintains the shape of the bush and helps to prolong its life.

Boronia elatior and *Boronia heterophylla* both have good displays of neat, carmine and deep rose flowers lasting 6 to 8 weeks from November onward. Growing to a height of 4 or 5ft., they are most effective for low hedges. Young plants should be nipped back to give a well-covered bush. After that little pruning is necessary. They do equally well in full sun or shade and the flowers stand up well in bad weather.

Boronia denticulata, a relatively new introduction with a low bushy habit, bears a mass of lilac mauve flowers in spring and requires the same treatment as *Boronia elatior*.

Bouvardias, natives of Mexico and Central America, are excellent small shrubs for the front of the border. Growing to a height of 3ft., they bear clusters of sweetly scented tubular flowers of colours ranging through whites and pinks to dark red, and some of these varieties have double flowers. Bouvardias are frost tender, but in a sheltered, sunny situation they continue to flower throughout winter. A good supply of moisture during summer is necessary. After plants have flowered spent wood should be cut away and the shrubs pruned back hard. By January new shoots will come away ready to produce flowers the next winter. The flowers last well in water and make most attractive gifts in a period when flowers are scarce.

Chimonanthus praecox, commonly known as wintersweet, is a native of China. The small, waxy, red-centred flowers are produced early in winter, often before the old yellowed leaves are all shed. Occasional pruning is necessary to keep a good shape; any other pruning should be done to encourage development of flowering spurs. Wintersweet does equally well in sunny or shady positions and prefers a rich, cool, moist root run. The seed pods, which are large and brown, hang on the bush for a considerable time, but not all of them contain seeds and not all the seeds are viable. The hard-coated seed should be sown

Photographs on this page and page 175 by Douglas Elliott.

"I installed a Brown Bros.'

CENTRIFUGAL PUMP

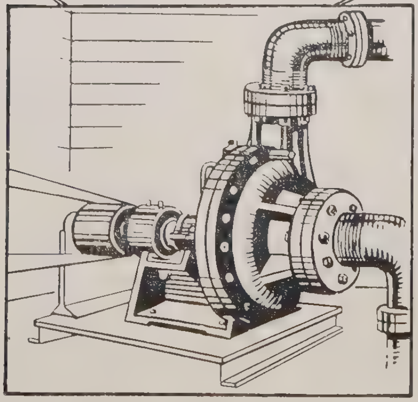
. . . for its '2-way' feature:

- IN SUMMER DROUGHTS I CAN FLOOD MY LAND.
- IN WINTER FLOODS I DRAIN OFF EXCESS WATER.

—WITH THE SAME PUMP."

Yes, our Centrifugal pump has won great praise everywhere for its rugged dependability and its knack of standing up to hard work for years on end, with little or no attention. Supplies 5 to 1000 gallons per minute at "heads" up to 240ft. Ideal for all general water supply, stock watering, sprinklers, etc. Can be controlled by Automatic switches.

LET US SUPPLY FULLEST DETAILS.



Brown Bros.
ENGINEERS LTD.

Pumping Machinery Specialists since 1908.
COLOMBO STREET, CHRISTCHURCH.
P.O. Box 548J. Telephones: 31-215, 31-217, 30-710.

"THE FARM TRACTOR"

Department of Agriculture Bulletin No. 255, "The Farm Tractor", gives a simple, diagrammatically illustrated description of the working principles of different types of internal combustion engines and sound advice on tractor care and maintenance. It is obtainable free at any office of the Department.

CHAPS ?
CRACKED TEATS ?
BRUISED UDDERS ? . . . .

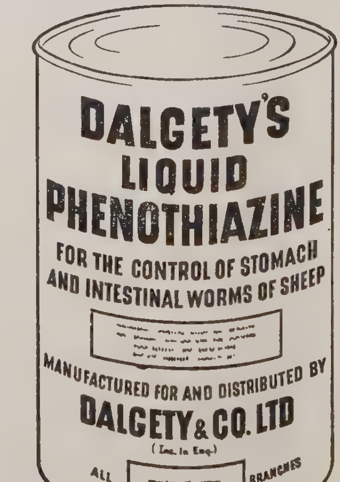
Then apply ELTHAMOL VETERINARY Ointment smartly. Made by the N.Z. Co-op Rennet Co. Ltd., of Eltham, ELTHAMOL has proved again and again that a combination of strict laboratory control in manufacture coupled with a background of practical and personal experience by farmer directors, can produce an all-round veterinary ointment of surpassing excellence. Sold in 2, 10 and 36lb. tins. It's most economical to buy the larger sizes.

ELTHAMOL
VETERINARY OINTMENT

Obtainable from all Stock and Station Agents and Dairy Factories.

Made exclusively by
THE N.Z. CO-OP RENNET CO. LTD.
Bridge Street, Eltham.

SAFE - ECONOMICAL - EFFECTIVE


DALGETY'S
LIQUID
PHENOTHIAZINE
FOR THE CONTROL OF STOMACH AND INTESTINAL WORMS OF SHEEP
MANUFACTURED FOR AND DISTRIBUTED BY
DALGETY & CO. LTD
(Inc. in Eng.)
ALL BRANCHES

- Ready Mixed
- Stays in Suspension
- Does Not Cake
- Gives Even Doses
- One Stirring Lasts All Day
- Can Be Used With Any Standard Phenothiazine Pistolet or Automatic Gun.

Phenothiazine also available in TABLETS OR POWDER.

DALGETY & CO. LTD.
ALL BRANCHES

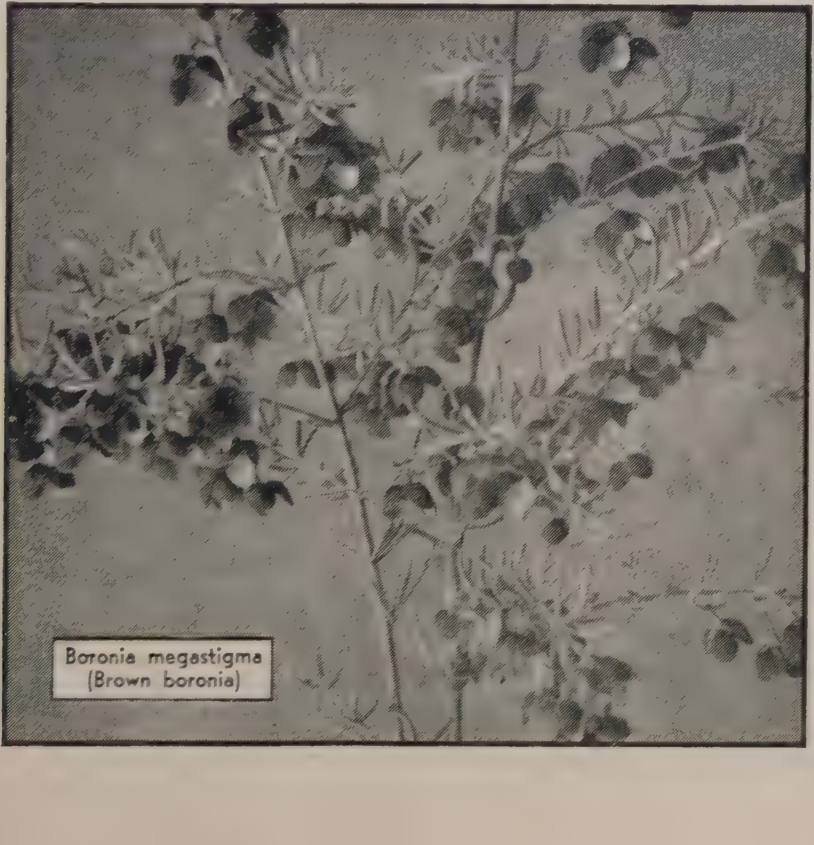
as soon as it is ripe. To speed up germination the hard coat is nicked with a sharp knife to allow moisture to penetrate readily. In this way seeds which are hollow may be discovered and discarded. These seeds have a particular attraction for rats and mice and boxes of seed need some protection from them. As the seeds germinate two large, round, fleshy seed leaves appear, but the seedling is not ready for transplanting until the finer, true leaves are seen to be developing. Wintersweet lasts well when picked and used in vases; the scent gradually fades, but the flowers persist quite well.

Choisya ternata, known as Mexican orange blossom, is a handsome evergreen shrub growing to a height of from 5 to 6ft. For 2 months during winter it is covered with white, scented blossom and it has glossy green leaves right to the ground. It is a useful shrub on hard, dry banks and does equally well in wet positions, and furthermore will stand quite a heavy amount of salt spray in the atmosphere. Little or no pruning is required.

Daphne odora rubra
(Pink daphne)

Daphnes

Daphne in its white and pink varieties (*Daphne odora* and *D. odora* var. *rubra*) is probably the favourite among scented shrubs. With care and attention it can be encouraged to grow and flourish in a wide range of soils. The ideal soil is one free from lime, well drained, and containing a good supply of organic matter. A situation in partial shade with a cool root run which does not dry out in summer is excellent. Daphne can be grown supported on a box framework or it can be trained espalier fashion against a wall. Alternatively it can be grown as a standard bush or encouraged to trail down a bank. Whichever method of growth is chosen, plenty of space should be allowed for development of the bush. Often daphnes are planted too close to paths and the edges of borders and as they develop they encroach on lawn and paths. Allowance should be made for the bush to grow to a diameter of at least 4ft. Daphnes will not flourish in a wet boggy situation or in a hard, dry part of the garden. These conditions will cause the leaves to yellow. Daphnes are also subject to a virus disease which causes mottling and at times unsightly curling of the foliage. The virus affection does not materially affect the growth or blossoming of the plant. Sufficient pruning is carried out when flowers are picked; moderately heavy picking keeps the bush flowering for a long period.



Boronia megastigma
(Brown boronia)

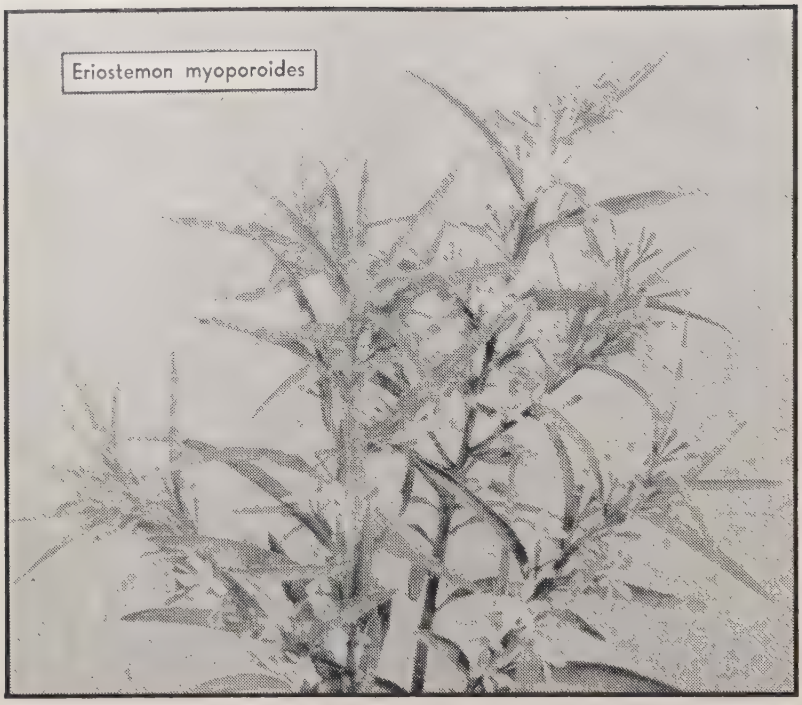
For colder districts *Daphne mezereum* does better than *Daphne odora*. A dwarf shrub of 4ft., it bears deep purply pink flowers along bare stems in spring and these are followed by bright red berries.

Daphne cneorum is a low-growing shrub which develops a mat of low, spreading branches and is covered with a mass of round clusters of deep pink fragrant flowers in November and December. It requires a position in full sun, with a cool, moist root run and a good supply of organic matter. It is an excellent subject on a bank or sloping garden.

Daphne genkwa is not scented, but it is a charming member of the daphnes. During winter it produces abundant clusters of tubular, mauve flowers on the bare, brown stems of the previous year's growth. While young it needs pinching back to develop a good bush. A slow-growing, delicately shaped shrub, it reaches a height of 5ft. It is fairly hardy and does well in free-draining soil in partial shade.

Diosmas

Diosma ericoides, known as breath of heaven, is a handsome evergreen shrub with pleasantly perfumed foliage. It is a native of South Africa and grows to a height of 3ft. *Diosma complexa* is the pink-flowered form. Diosmas are quite hardy and do best in a good garden soil in a sunny position. To develop a good shape the young plant should have the new



Eriostemon myoporoides

growths shortened by half their length.

Eriostemon myoporoides is an evergreen native of Australia. Its foliage is scented and in spring it bears pink-tipped buds which open into white, scented flowers. It grows readily in average garden soil and is a useful addition to the shrub border. Its naturally good shape makes pruning practically unnecessary.

Hamamelis mollis, Chinese witch-hazel, is a most unusual winter-flowering shrub. A very hardy deciduous shrub growing to a height of 6ft., it can be trained to develop a trunk and form a small tree. The best situation is in the sun where the soil does not dry out badly during summer. The twisted yellow thread petals of the flowers cluster along the bare branches well before the leaves appear, and for its large ribbed tomentose leaves alone it deserves a place in the garden.

Lavender

Lavandula officinalis, lavender, is an old favourite that grows readily from cuttings. Lavender hedges are most effective and give a good crop of flowers for lavender sachets. To retain fragrance in flowers for sachets the flowers should be cut when they have opened only half way up the spikes and picked early in the morning or in the cool of evening. The oil bearing the perfume is volatile and for this reason the flowers should be kept away from the sun and dried quickly indoors in a warm position.

Luculia gratissima is a frost-tender shrub native to the Himalayan temperate region. In milder districts it flowers during winter, giving a gorgeous display of colour with large clusters of pink, scented, tubular flowers. Luculias will not stand frost or strong winds, but they will flourish in a sunny, sheltered spot in a well-drained soil rich in organic matter and free from lime. The bush grows with a spreading habit to a height of 12 to 16ft. and the flowers on different bushes vary in colour through pale to deep pink. A good supply of water during summer is necessary. Picking the flowers is usually sufficient pruning, but if the bush requires shaping, it should be pruned when the flowers are over. Long branches of luculia with their stems crushed slightly and in deep vases last well indoors.

Lippia citriodora or lemon-scented verbena as it is commonly called, grows to a height of 10ft. and among those who know its lemon-scented leaves it is a great favourite. Young plants should be pruned back to develop a bushy habit, otherwise the tree becomes very open and with its naturally sparse leaves and small flowers it does not develop a compact bush.

Oleanders

Nerium oleander attains a height of 8ft. and can be obtained in a wide range of named varieties in single or double forms with colours from white to pink to dark red. Oleanders, as they are commonly called, do well in average garden soil, but in a position where their roots will be cool and moist and not dry out in summer they are superb. They do well in places with high humidity and in coastal areas. Oleander is poisonous in all its parts—flowers, leaves, and stems—and it is not advisable to use it as a cut flower, but in the garden the scent can be enjoyed. Unfortunately black soot on oleanders often makes them unsightly. This sooty mould forms on the honey dew excreted by scale insects which often attack the plant. Scale insects can be controlled by spraying once during November and later in summer with summer oil (1 part in 50 parts of water). These two sprays should kill the scale and remove the source of the black soot.

Osmanthus delavayi is covered with a mass of small, white, scented flowers in September. This shrub with its shiny small leaves and scented flowers, though not very well known, is a useful addition to the shrub garden and does well in a partially shaded position.

Osmarea burkwoodi has as one of its parents *Osmanthus delavayi*, and the two shrubs are similar; it produces white, scented flowers and larger, shiny leaves. Conditions for growth are the same.

Philadelphus coronarius, mock orange, is a favourite spring-flowering shrub. The flowers develop on the ripened wood of the previous season's growth and the shrub has a tendency to bare, leggy stems at the base, but by cutting out the old wood after flowering this can be prevented to a limited extent. Mock orange can be obtained in 5 good varieties and it makes an excellent shrub for the background of the herbaceous border. It does equally well in average or poor soils.

Rosmarinus officinalis, rosemary, makes a most attractive hedge, especially where people brushing past it release its pleasant fragrance. *Rosmarinus officinalis* var. *prostratus*, the prostrate form, makes a very graceful covering on banks and built-up walls.

Lilacs

Syringa, commonly known as lilac, is one of the most popular spring-flowering shrubs. There is a wide range of varieties, some single, some double; colours are bluish purple, wine red, rose, mauve, and white. Lilacs establish well in average garden soil in an open sunny position. They are gross feeders and appreciate quantities of organic matter, either compost or farmyard manure. Lilacs often throw a mass of suckers and take years to come to flowering. These suckers need to be pulled out continually to allow the full vigour of the bush to go toward the production of flowers.

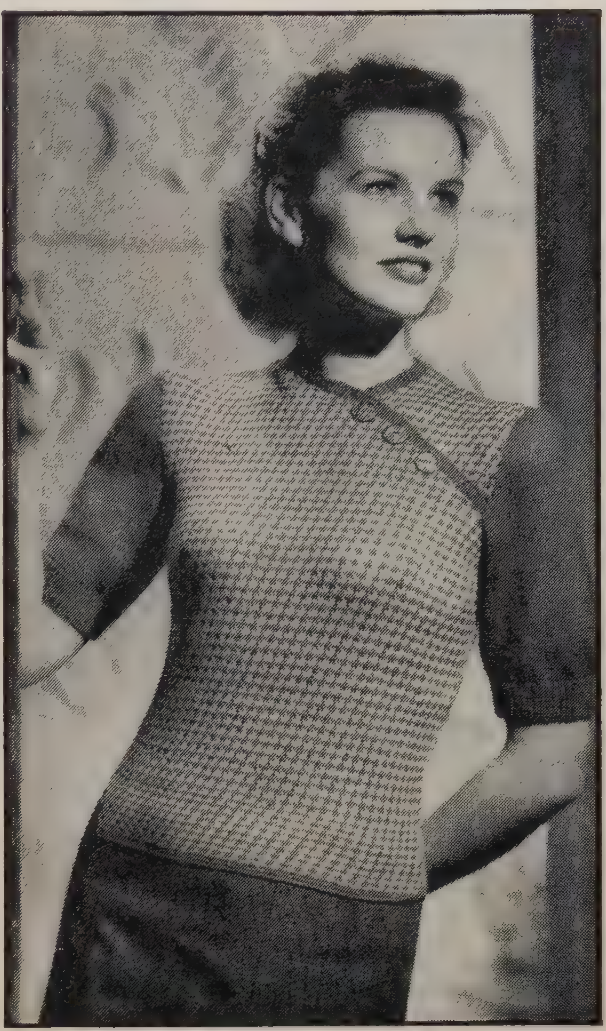
Viburnums

Viburnum carlesii, a native of Korea, is claimed to rival the daphne for scent. It grows to a height of 4ft. and although classed as a deciduous shrub, it often retains its foliage in milder districts. Of free-flowering habit and attractive grey foliage, it begins to bloom early in spring and the individual flowers are white-flushed pink, borne in compact heads, and often 3in. across. *Viburnum burkwoodi* which has *Viburnum carlesii* as one parent, greatly resembles it, but has bigger, freer growth and larger flower heads. The buds are pink tipped and open to white, strongly scented flowers which are useful for cutting. Sometimes a few flowers open during warm spells in winter, but this does not affect the main blooming in spring. *Viburnum fragrans*, a native of Japan, grows to a height of 12ft. and also produces pinkish white flowers.

The viburnums need only occasional pruning to maintain a good shape. Any pruning to encourage flowering should be done to develop spurs, as the flowers are produced on spurs. The viburnums do well in most soils, but *Viburnum fragrans* does better in a warm position.

A Smart Knitted Jumper in Contrasting Colours

WITH a striking design in houndstooth check, slanting neckline buttoning on the left-hand side, and contrasting colours of pink and brown, the knitted jumper illustrated has a smart appearance. The sleeves are worked in stocking-stitch in the darker shade.



THE materials required are: 4oz. of 3-ply wool in snuff brown and 2oz. in salmon pink, a pair each of Nos. 9 and 12 knitting needles, and 3 buttons.

Measurements: Length, 19in.; to fit 34in. bust measurement; sleeve seam, 5½in.

Tension: 8 sts. and 9 rows to 1in.

Abbreviations: K., knit; p., purl; tog., together; st., stitch; st.-st., stocking-stitch; beg., begin or beginning; cont., continue; inc., increase or increasing; dec., decrease or decreasing; rem., remain or remaining; alt., alternate; ptn., pattern; rep., repeat.

The Back

Using No. 12 needles and brown wool, cast on 111 sts. Work 4 rows in garter st. Beg. ptn.:—1st row: With brown wool (k. 2, slip 1), rep. to end of row.

2nd row: P. 3rd row: With pink (slip 1, k. 2), rep. to end. 4th row: P.

5th row: With brown, k. 1 (slip 1, k. 2), rep. to last 2 sts., slip 1, k. 1.

6th row: P. 7th row: With pink (k. 2, slip 1), rep. to end.

8th row: P. 9th row: With brown (slip 1, k. 2), rep. to end.

10th row: P. 11th row: With pink, k. 1 (slip 1, k. 2), rep. to last 2 sts., slip 1, k. 1. 12th row: P. These 12 rows form the ptn. Rep. ptn. twice more. Change to No. 9 needles and cont. in ptn., inc. 1 st. at both ends of every 10th row until there are 129 sts. Work 18 more rows, finishing on 12th row of ptn.

Shaping Armholes

Cast off 6 sts. at beg. of next 2 rows. Dec. 1 st. at both ends of every row until 99 sts. rem. Work 12th row of ptn. Rep. rows 1 to 12 four times. Shape the shoulders by casting off 8 sts. at beg. of next 8 rows. Cast off rem. 35 sts.

The Front

Work as for the back until armhole shaping has been completed and there are 99 sts. on the needle. Work 12th row of ptn.

Next row: Cast off 2 sts., ptn. to end.

Next row: P. to last 2 sts., p. 2 tog. Rep. these 2 rows 3 times more.

Next row: K. 2 tog., ptn. 3, cast off 2, ptn. to end.

Next row: P. to last 4 sts., cast on 2, p. 2, p. 2 tog. Now cont. in ptn., dec. 1 st. at front slope on every row and making a buttonhole on every following 9th and 10th rows until 3 buttonholes have been worked. Cont. dec. at front slope until 38 sts. rem.

Shaping Shoulder

Next row: Cast off 8 sts., p. to last 2 sts., p. 2 tog.

Next row: K. 2 tog., ptn. to end. Rep. these 2 rows twice more. Cast off rem. 8 sts.

Left Side of Front

Using No. 9 needles and brown wool, cast on 48 sts. K. 2 rows. Now cont. in ptn. until 2 complete ptns. have been worked and 8 rows of third ptn. Dec. 1 st. at neck edge of following 6 rows, then 1 st. at neck edge on every alt. row until 35 sts. remain, ending at armhole edge.

Next row: Cast off 8 sts., ptn. to end.

Next row: P. 2 tog., p. to end. Rep. these 2 rows twice more. Cast off rem. 8 sts.

The Sleeves

Using No. 12 needles and brown wool, cast on 90 sts. and work in k. 1, p. 1 rib for 1½in. Change to No. 9 needles and cont. in st.-st., inc. 1 st. at both ends of every 6th row until there are 98 sts. Cont. without inc. until work measures 5½in. from beg.

Shaping Top

Cast off 6 sts. at beg. of next 2 rows. Dec. 1 st. at both ends of every row until 64 sts. rem. Then dec. 1 st. at both ends of every alt. row until 28 sts. rem. Cast off.

Neck Band

With right side facing, and using brown wool and No. 12 needles, pick up and k. 96 sts. along right front slope. Work 5 rows in k. 1, p. 1 rib. Cast off. Join left shoulder seam and with right side of work facing pick up and k. 88 sts. along back of neck and left front slope. Work 5 rows in k. 1, p. 1 rib. Cast off.

To Make up

Press. Sew up side and sleeve seams and right shoulder seam. Sew in sleeves. Sew on buttons to the left side of the front to correspond with buttonholes. Sew eye to edge of left front neck ribbing and hook to right front neck ribbing to correspond. This will keep the neck firmly fastened above the top button.

Sponge Cakes

By MOLLY MACPHERSON,
Field Officer in Rural Sociology,
Department of Agriculture, Auckland

A SPONGE cake may be the climax of an afternoon tea or supper; it is also the result of a careful scientific experiment. A beginner by following all cooking directions carefully can bake sponge cakes successfully and will find that practice will improve every sponge cake.

A PERFECT cake has a delicate flavour. The texture is light, fine, and even, and the sponge has a tender, moist surface and a flat or slightly rounded top which feels spongy when pressed with the finger.

• • •

1. Read all directions first and follow them carefully.

GENERAL HINTS ON MAKING SPONGES

2. Before cake mixing is begun prepare the baking tins by greasing the interior surfaces well. Dredge flour over the greased tin and shake out surplus flour, or the bottom of the tin may be covered with a piece of greased greaseproof paper and the sides of the tin greased.

3. Beat the eggs well until they are foamy and pale yellow. If the whites are to be beaten separately, they should be beaten until stiff but not dry.

4. The best results are obtained with fresh eggs; eggs that are 3 days old or older beat up to a larger volume.

5. Duck eggs make lighter and larger sponges.

6. Preserved eggs beaten with a pinch of cream of tartar beat up to a larger volume than fresh eggs.

7. If the mixing bowl is placed in hot water, the eggs will beat up more quickly.

8. Butter sponges have better keeping qualities than those made without butter.

9. Cocoa has a slightly drying effect on a sponge mixture; therefore with a sponge converted to a chocolate sponge substitute ¾ cup of flour and ¼ cup of cocoa for each cup of flour set down in the recipe.

10. Sift all the dry ingredients two to three times.

11. Fold in the dry ingredients after beating the eggs, except with the three-minute sponge (see recipe on page 181).

12. Fill the cake tin two-thirds full to have the cake rise to the top of the tin.

13. When baking sponges place them in the lower half of the oven, leaving at least 3in. of air space below the cake tin.

14. Sometimes to reduce heat in the oven top and prevent the top of the sponge setting before it rises, place a cold oven slide near the top of the oven.

15. To cool the cake remove it from the tin while hot by inverting it on to a wire cake rack.

16. Finish the cake with attractive fillings or icing, keeping the decoration simple.

• • •

Careless Measuring of Ingredients

1. The cake falls, runs over top of the pan, or is too tender and crumbly to handle. **Reason:** There is too much fat, rising agent, or sugar.

2. The cake has an uneven surface. **Reason:** There is too much flour or not enough liquid.

CAKE FAULTS AND THEIR CAUSES

3. The cake has a crackled or sticky crust. **Reason:** Too much sugar has been used.

4. The cake has a coarse grain. **Reason:** Too much rising agent has been used.

5. The cake is tough or dry. **Reason:** Too much flour or rising agent or insufficient fat, sugar, or liquid has been used.

Incorrect Baking

1. Too hot an oven may cause the cake to be undersized, burnt, have a cracked top, a tough crust, or a heavy texture.

2. Too slow an oven may cause the cake to run over the top of the tin, stick to the tin, or have a coarse grain or soggy crust.

3. Insufficient baking may cause the cake to fall or be soggy or fall apart as it comes out from the tin.

4. Baking for too long may result in a dry cake or a hard crust.

• • •

Sponge Recipes

Plain Butterless Sponge Sandwich (1)

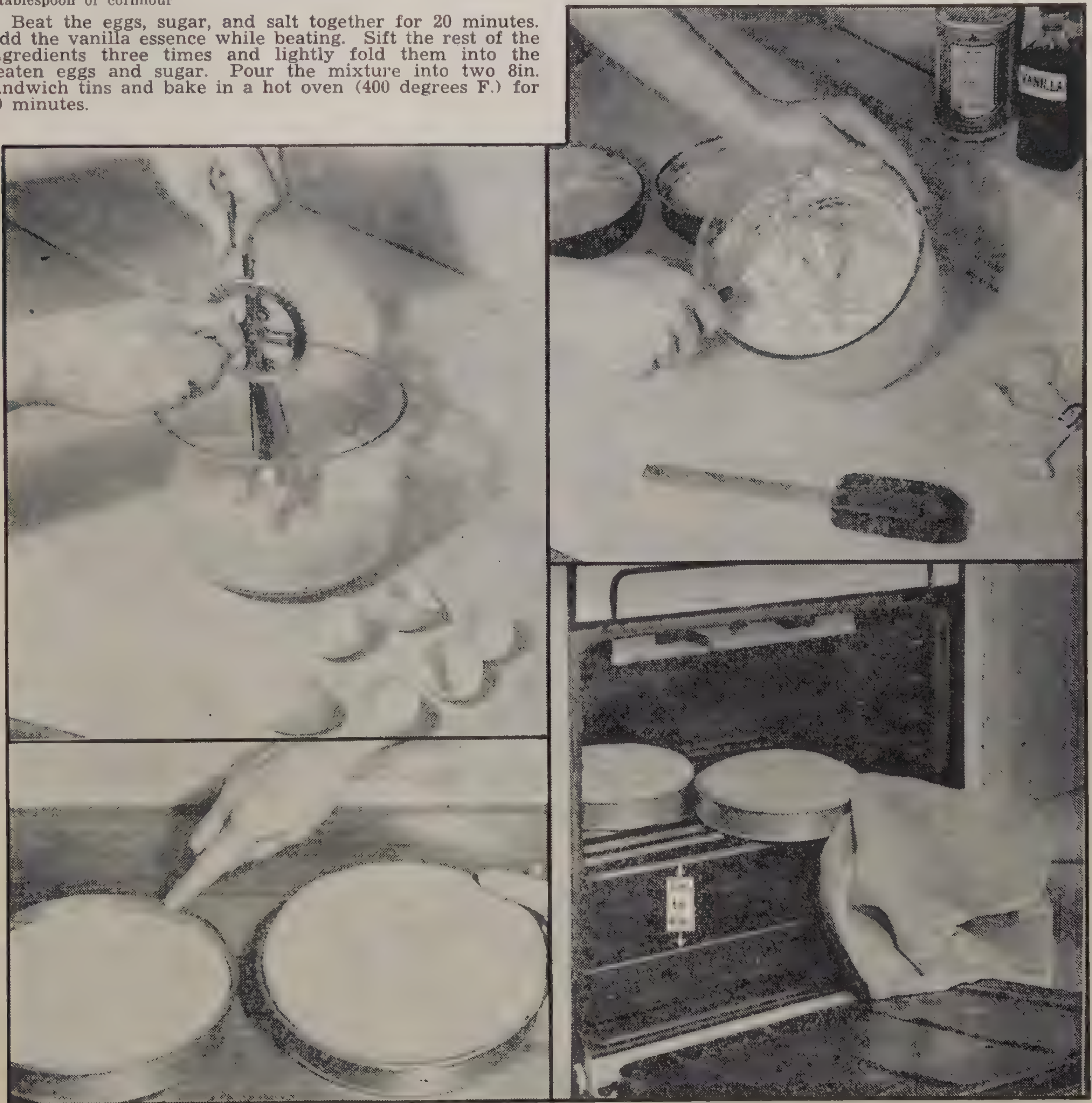
3 eggs
3 tablespoons of sugar
3 tablespoons of flour
1 tablespoon of cornflour
½ teaspoon of baking powder
Pinch of salt
½ teaspoon of vanilla essence

Beat the eggs, sugar, and salt together for 20 minutes. Add the vanilla essence while beating. Sift the rest of the ingredients three times and lightly fold them into the beaten eggs and sugar. Pour the mixture into two 8in. sandwich tins and bake in a hot oven (400 degrees F.) for 20 minutes.

Plain Butterless Sponge Sandwich (2)

4 eggs
8oz. of sugar
4 tablespoons of cold water
6oz. of flour
2oz. of cornflour
2 teaspoons of baking powder
Pinch of salt
½ teaspoon of lemon essence

Beat the eggs for 5 minutes. Add the sugar, 1 tablespoon at a time, and continue beating for 15 minutes (until thick and foamy). Gently mix in the cold water and the essence. Sift the remaining dry ingredients three times and gently fold them into the eggs and sugar. Pour the mixture into two 8in. sandwich tins or three 8in. ring tins. Bake in a moderately hot oven (375 degrees F.) for 25 minutes. This mixture put into greased patty pans, a teaspoon of it to each, will also make 3½ dozen butterfly cakes, which are baked in a hot oven (400 degrees F.) for 8 to 10 minutes.



Upper left—Beat the eggs until they are foamy and pale yellow. Upper right—Fold in the dry ingredients. Lower left—Fill the cake tins two-thirds full before baking. Lower right—Leave 3 to 4in. of air space below cake tins when baking.

If you switch to

DRY DRENCHING

with "PHENOVIS"

Phenothiazine Pellets

You'll Drench Quicker And Minimise The Risk Of Wool Staining.

THIS scientific phenothiazine DRY drench has won New Zealand-wide praise.

"PHENOVIS" Pellets are safe, accurate, labour-saving. Accurate dosage is certain because each contains exactly 5 grammes of phenothiazine. The dose, given by a special instrument, ensures no "spit-out" and minimises risk of wool staining during drenching. Easier to carry than heavy liquids —and there's much less chance of waste. Order now for the season ahead.

Distributors:

SUMMIT PRODUCTS LTD.

Box 328, Palmerston North.

SEND IT AIR FREIGHT!

SPEEDY ECONOMICAL INTER-ISLAND RAIL-AIR TRANSPORT

Does your consignment weigh as much as six tons? Is it up to 40 feet long by 6 feet square? Or is it something both bulky and heavy —a motor truck, perhaps? Practically anything can now be handled by the Railway Department's inter-Island RAIL-AIR service.

Rates are as cheap as surface transport and often cheaper. Big Bristol Freighters maintain regular shuttle services across Cook Strait, and the revolutionary new "Cargon" system reduces handling. Every railway station is a RAIL-AIR depot.

Ask your Nearest Stationmaster About RAIL-AIR

There is no need to go without delicious custard even if eggs are much too costly — make your custard as thousands of others do — with Edmonds Sure to Please custard powder.

EDMONDS

custard powder

-of course!

T. J. EDMONDS LTD., CHRISTCHURCH.

MAKES CROPS

Grow!

Basic Slag is a valuable source of quickly available phosphate for farm, garden and orchard crops. It is especially effective on swedes, turnips and rape and leguminous crops. Order from your fertiliser merchant—regular shipments arriving.

BELGIAN BASIC SLAG SYBESCO

BASIC SLAG

Butter Sponge

4 eggs
1 barely level cup of sugar
¼ cup of hot milk
½ teaspoon of vanilla essence
2 level teaspoons of butter melted
1 teaspoon of baking powder
1 level cup of flour

Sift the flour, baking powder, and salt together three times. Beat the eggs and sugar together until very thick. Fold the hot milk very lightly into the eggs and sugar. Fold in the sifted ingredients. Lastly add the melted butter and the vanilla essence and fold them in. Bake in a moderately hot oven (375 degrees F.) for 25 to 30 minutes in a tin 12in. x 8in.

Mix half a packet of jelly crystals according to maker's directions and when the jelly has nearly set put it on the top and sides of the sponge. Sprinkle desiccated coconut on the jelly. The cake may be cut in halves sideways and a cream filling put in.

Three-minute Sponge

3 eggs
1 cup of flour
¾ cup of sugar
2 tablespoons of milk
3oz. of melted butter
2 teaspoons of baking powder
½ teaspoon of vanilla essence
Pinch of salt

Sift the flour and sugar. Put all the ingredients except the baking powder in a mixing bowl and beat with a fork for 3 minutes. Add the baking powder and pour into two 7in. sandwich tins—or one 9in. square tin—which have been greased. Bake in a moderately hot oven (375 degrees F.) for 20 to 25 minutes.

Chocolate flavour: Omit the vanilla and add 1 level tablespoon of cocoa to the ingredients before beating.

Coffee flavour: Omit the vanilla essence and replace the tablespoon of milk with 1 tablespoon of coffee essence.

Buffalo Cake

3oz. of butter
1 level cup of sugar
3 eggs
1 slightly heaped cup of flour (sifted)
3 tablespoons of milk
3 teaspoons of baking powder
½ teaspoon of vanilla essence

Cream the butter and sugar together. Beat in 1 egg well. Add the flour, milk, and 2 eggs. Beat the mixture for 3 minutes. Lastly fold in the baking powder. Pour the mixture into a 9in. square tin. Bake in a moderately hot oven (375 degrees F.) for 30 to 40 minutes.

Butterless Chocolate Sponge

3 eggs
1 cup of sugar
1 cup of flour
2 dessertspoons of cocoa
½ cup of boiling milk
1 teaspoon of vanilla
1 teaspoon of baking powder
Pinch of salt

Beat the eggs and sugar together until thick and creamy (15 to 20 minutes). Sift the flour, cocoa, baking powder, and salt together three times and lightly fold them into the sugar and egg mixture. Add the vanilla and the boiling milk and lightly mix them in. Pour the mixture into two 8in. sandwich tins immediately and bake in a moderately hot oven (375 degrees F.) for 30 minutes.

One-egg Chocolate Sponge

4oz. of butter
1 cup of sugar
1 egg
2 cups of flour
1½ teaspoons of baking powder
2 tablespoons of cocoa
2 tablespoons of golden syrup
1½ cups of cold milk
1 teaspoon of baking soda

Sift the flour, baking powder, and the cocoa three times. Dissolve the baking soda in the milk. Mix the golden syrup into the milk and baking soda. Cream the butter and sugar together. Add 1 egg and beat well. Mix the milk mixture into the butter, sugar, and egg alternately with the sifted dry ingredients, mixing well between each addition. Pour the prepared mixture into a 9in. square cake tin and bake in a moderately hot oven (375 degrees F.) for 35 to 40 minutes. An additional egg in this mixture will make a larger sponge.

Coffee Sponge

3 eggs
6oz. of sugar
3oz. of butter
1 tablespoon of coffee essence
2 tablespoons of milk
4½oz. of flour
2oz. of cornflour
1 heaped teaspoon of baking powder
Pinch of salt

Beat the eggs and sugar together for 15 minutes. Melt the butter and mix it in. Add the coffee essence and milk and mix them in. Add the remaining dry ingredients sifted together 3 times and beat all together for 2 minutes. Bake in a moderately hot oven (375 degrees F.) for 25 minutes.

Spice Sponge

3 eggs
¾ cup of sugar
1 dessertspoon of golden syrup
½ cup cornflour
Pinch of salt
2 teaspoons of cocoa
2 teaspoons of spice
2 teaspoons of cinnamon
2 heaped teaspoons of flour

Beat the eggs and sugar until thick and creamy (15 to 20 minutes). Beat in the golden syrup. Fold in the rest of the dry ingredients sifted together three times. Pour into two 9in. sandwich tins and bake in a moderately hot oven (375 degrees F.) for 15 to 20 minutes.

Banana Sponge

4oz. of butter
6oz. of sugar
2 eggs
2 bananas (mashed)
1 level teaspoon of baking soda
8oz. of flour
2 tablespoons of boiling milk
½ teaspoon of vanilla essence
Pinch of salt

Cream the butter and sugar, beat in the 2 eggs one at a time. Sift the flour, baking powder, and salt together three times. Dissolve the baking soda

Below—Coffee sponge with simple decoration.

in the boiling milk and add the mashed bananas. Add the sifted ingredients to the creamed butter and sugar alternately with the banana mixture. Beat after each addition until smooth. Pour the mixture into two 9in. sandwich tins and bake in a moderate oven (350 degrees F.) for 30 minutes.

White Sponge Cake

4oz. of butter
1¼ cups of sugar
3 egg whites
¾ cup of milk
2 cups of flour
2 teaspoons of baking powder
½ teaspoon of vanilla essence
Pinch of salt

Sift the flour, baking powder, and salt together three times. Cream the butter and 1 cup of sugar. Beat the 3 egg whites to the texture of meringue mixture, gradually adding ¼ cup of sugar until the mixture holds up in soft peaks. Add to the sifted ingredients and the creamed butter and sugar alternately with the milk. Add the vanilla essence and beat for 2 minutes. Add the meringue mixture and beat for 1 minute. Pour the mixture into two 9in. sandwich tins and bake in a moderately hot oven (375 degrees F.) for 25 minutes.

Sponge Roll

3 eggs
4oz. of sugar
6oz. of flour
½ cup of boiling water
Pinch of salt
1½ teaspoons of baking powder
½ teaspoon of vanilla essence

Beat the eggs and sugar together until thick and creamy (15 to 20 minutes). Sift the flour, baking powder, and salt together three times and fold into the beaten eggs. Add the vanilla essence and the boiling water and mix them in. Pour the mixture into a Swiss roll tin. Bake in a moderately hot oven (375 degrees F.) for 20 minutes. When the sponge is cooked turn it out on to a sheet of greaseproof paper sprinkled with icing sugar and roll immediately. When cool unroll the sponge, trim the edges, and spread with jam or filling and reroll.

Fillings for Sponges

Butter or Vienna Icing and Filling

8oz. of butter
4 to 6oz. of icing sugar
1 teaspoon of vanilla essence

These quantities make sufficient for filling and decorating a sponge sandwich. Cream the butter, add the icing sugar, a tablespoon at a time, and beat the icing until it is smooth and creamy. Add the flavouring and food colouring if required.

The filling may be varied as follows:—

Chocolate butter icing: Replace the vanilla essence with 1oz. of cocoa mixed with 1 tablespoon of hot water.

Coffee butter icing: Replace the vanilla essence with 2 teaspoons of coffee essence.

Mocha butter icing: Replace the vanilla essence with 1 teaspoon of coffee essence and ½oz. of cocoa blended with 1 tablespoon of hot water.

Lemon butter icing: Replace the vanilla essence with 1 teaspoon of finely grated lemon rind and 1 teaspoonful of lemon juice. If the icing is needed for piping, omit the grated rind, which may block the icing tube.

Mock Cream Filling (1)

4oz. of butter
4oz. of sugar
½ cup of boiling water
½ teaspoon of vanilla essence

Beat all together until the mixture becomes creamy. Use with a layer of jam between the sponge layers.

Mock Cream Filling (2)

1 cup of boiling milk
1 tablespoon of cornflour
1 tablespoon of butter
1½ tablespoons of sugar
1 teaspoon of vanilla essence

Thicken the boiling milk with the cornflour and leave it to get quite cold. Cream the butter and sugar and add the thickened milk, a tablespoon at a time, beating well. Add the vanilla essence. Use with a layer of jam between the sponge layers. One cup of mashed bananas may be added to the mixture.

Lemon Jelly Filling

1 cup of water
5oz. of sugar
1 teaspoon of grated lemon rind
1oz. cornflour
2 tablespoons of lemon juice

Mix the cornflour to a smooth paste with a little of the water. Heat the remaining water and when it is boiling pour it on to the cornflour paste and stir well. Cook for 3 minutes. Add the sugar and stir until dissolved. Add the lemon rind and juice and allow the filling to cool before using.

Banana Filling

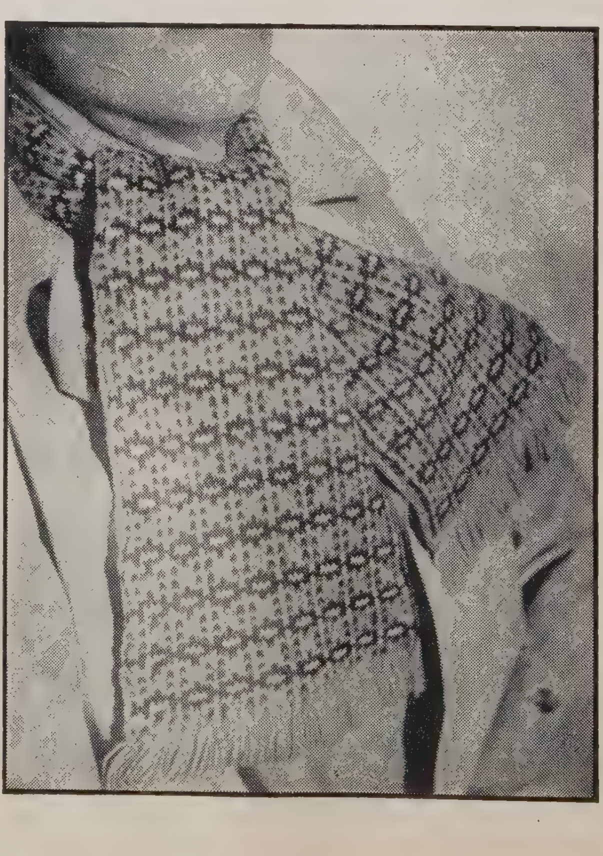
1 tablespoon of orange or lemon juice
1 tablespoon of sugar
2 bananas

Peel and slice the bananas, cover with the lemon juice and sugar, and spread between the layers of banana sponge or any plain sponge.

All photographs by Sparrow Industrial Pictures Ltd.

Serviceable Woollen Scarf in Three Colours

HAND-KNITTED scarves are hard wearing, warm, and can be laundered as easily as other coloured woollens. Instructions for knitting the scarf illustrated are given here.



MATERIALS required are 3oz. of 3-ply wool in a medium colour, 1oz. of 3-ply wool in a light colour, 1oz. of 3-ply wool in a dark colour, 2 No. 10 knitting needles, and a crochet hook.

Measurements are: Length, 40in. Width, 6in. Tension is 8 st. to 1in.

Abbreviations used are: K. knit, p. purl, st. stitch(es), patt. pattern, rep. repeat, st.st. stocking stitch, md. medium, lt. light, dk. dark.

With md. wool cast on 102 st. and work 2 rows in st.st. Now work in patt. thus:—

First row: K. using md. (wool); second row: P. 51 md., * 1 dk., 1 md., 1 dk., 3 md. Rep. from * to last 3 st., 1 dk., 1 md., 1 dk. Third row: K. 3 md., * 1 md., 1 dk., 4 md. Rep. from * to last 51 st., k. 51 md. Fourth row: P. 51 md., * 1 dk., 1 lt., 4 dk. Rep. from * to last 3 st., 1 dk., 1 lt., 1 dk. Fifth row: K. 3 dk., * 3 lt., 3 dk. Rep. from * to last 51 st., k. 51 md. Sixth row: As for 4th row. Seventh row: As third row. Eighth row: As second row. These 8 rows form the patt.

Continue in patt. until work measures 40in., ending with an eighth patt. row. Work 2 rows in st.st. using md. Cast off.

To Make up

Press lightly. Fold lengthwise and join one end and side edge on wrong side. Turn to right side, join open end, and press.

Fringe

Cut a strip of cardboard 2¼in. wide and wind wool evenly round it. Cut wool along one edge of cardboard and, using 4 lengths of wool at a time, make a fringe at each end of scarf thus: Fold lengths of wool in halves and draw loop through edge of knitting with a crochet hook. Knot by drawing ends through loop. Rep. evenly along ends of scarf.

Gladiolus, a Popular Summer Flower

THE gladiolus is probably the most popular of summer flowers in New Zealand, where the climate, with abundant sunshine, is admirably suited to its requirements. The culture of the gladiolus is the subject of this month's article for the flower gardener by C. K. Ellis, Horticulturist, Department of Agriculture, Dunedin.

[*Sparrow Industrial Pictures Ltd. photo.*

GLADIOLI are sun lovers and this fact is probably the chief reason why they can be so successfully raised and grown in this country. In choosing the site on which they are to grow the gardener must bear this point in mind. A position away from trees and buildings will be found best. Shelter from winds is an advantage, because the tall nature of the fully grown plants makes them particularly susceptible to wind damage. Good drainage is also essential, as the corms will not tolerate waterlogging. The water-table, even in long, wet spells, should not rise to within at least a foot of the corms. The situation should be big enough, or several alternative situations should be available, to allow gladioli to be planted in a different place every season or so. This is necessary because the corms are susceptible to attacks of numerous soil-borne diseases.

Soil

Light, medium, or heavy loams will grow gladioli quite successfully, for soil texture does not appear to be as important as moisture-holding capacity in dry weather and rapid drainage in wet weather. New gardens brought in from pasture normally grow excellent gladioli, as the abundance of fibrous material incorporated in the soil seems to suit them. Cultivation of the ground consists of deep digging or ploughing in autumn and allowing the land to lie empty through winter, when frosts and winter rains bring it to an excellent condition for planting in early spring. Spring cultivation should consist of light working near the surface only. It is not necessary to dig again, as the corms appear to prefer a soil which has been allowed to settle before planting.

Fertilisers and Manures

Fresh animal manures are not beneficial in that they are likely to cause damage to the newly planted corms, but well-decayed manures of this type, incorporated into the soil a month or so before planting, improve the texture of the soil and provide a certain amount of plant food. The general manurial requirements of gladioli in New Zealand are not very well known, as little experimental work has been done on this subject, but a dressing consisting of 3 parts of blood and bone, 2 parts of superphosphate, and 1 part of sulphate or muriate of potash at a rate of 2 to 3oz. per square yard, incorporated into the soil before planting in early spring, will provide the bulk of the plant foods necessary in the correct proportions.

Preparations for Planting

Corms of a diameter less than ½in. and cormlets cannot normally be expected to produce flowers, but should produce foliage which will allow the cormlets to grow to flowering size in the next season. Very large corms, with two or more strong buds on the tops, should be cut before planting, each piece having a large bud and a piece of the basal plate. If planted without being cut, these big corms usually produce inferior foliage and flowers. Before planting it is advantageous to remove the skins or husks so that diseased corms can be recognised readily and be discarded. As many of the diseases of gladioli are soil-borne, only healthy specimens should be planted; badly diseased corms should be burnt. Where only small scars or scabs are present and the stock is valuable it is not necessary to discard the corms. A sharp knife can be used to cut out the scabs and scars, provided the cut is made well into healthy tissue. Before planting the corms it is wise to dip them in one of the proprietary dips which can be purchased from almost any nurseryman or seedsman. These compounds are usually made up of acidulated mercuric chloride and are used at about 1 part to 1000 parts of water.

The corms are soaked in the dip for 1 to 2 hours, are drained and allowed to dry, and then planted immediately afterward. A fresh dip should be prepared for each half-dozen batches of corms and the container should be topped up with the mixture at the correct proportions whenever necessary.

The depth of planting of gladioli corms should be varied according to the size of the corms and the type of soil. Large corms should be placed up to 6in. below the surface in light, well-drained soils, but smaller corms should not be planted much deeper than 2in. or 3in. on the heavy types of soil. Small corms and cormlets should be planted 1½in. to 3in. deep according to the soil type. Where the plants are to be grown in rows the minimum spacing should be 6in. to 8in. between the plants and 2ft. to 2ft. 6in. between the rows. Gladioli grown for garden display are best planted in groups among the other border plants and the same spacing, 6in. to 8in. between the corms, should be adhered to.

Flowering Period

The flowering period of gladioli can be extended by planting a few corms at weekly intervals from August until October, the August plantings applying only in areas which are free from severe late frosts.

The main planting should be made during the latter half of August in the warmer northern districts and during September or October elsewhere, provided the soil is in reasonable condition. A few corms may be kept for planting in November to produce very late flowers, but they must be carefully stored to keep them cool. A shaded cellar or even the household refrigerator would provide good storage for the few corms required. Should these late corms begin to produce green sprouts, they should be planted immediately.

The cormlets require as long a growing season as possible in which

NATURAL NUTRITION!

MADE ON THE TRAWLERS AT SEA from perfectly fresh livers, SOLVITAX is a **pure** Cod Liver Oil. The special fats contained in it are provided entirely by Nature and this highly tested and recommended product contains no synthetic vitamins.

SOLVITAX is an ideal NATURAL NUTRIMENT for all livestock—farm stock, show animals, poultry and domestic pets.

SOLVITAX

(LABORATORY TESTED)

Manufactured to the British Standards Specification by the British Cod Liver Oils (Hull and Grimsby) Ltd., Hull, England. If unable to procure write to

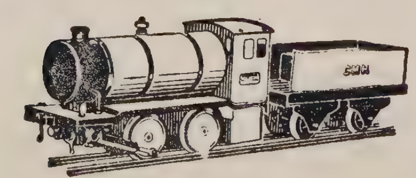
FACTORY REPRESENTATIVE
P.O. Box 816 Wellington, C.I.

The New Scientific rat killer that

KILLS AT A TOUCH

Sprinkle RANTU around rat holes and runways . . . the rat picks up the dust licks his feet and dies within 12 or 48 hours, usually outdoors. 100% effective This special preparation of Alpha Naphthyl Thiourea is now available at all stores in 3oz tins or larger sizes

ASHE
Distributors: T. A. MACALISTER LTD.
12 Albert St., Auckland



LIVE STEAM MODELS

For Junior. Send stamped addressed envelope for price list of trains and other "Cranko" models.

FOR FATHER

We undertake making obsolete parts and repairing full-sized machines and instruments with the same accuracy which has made our models famous.

MOVIE MODELS

Engineers and Model Makers,
Havelock North, Hawkes Bay.

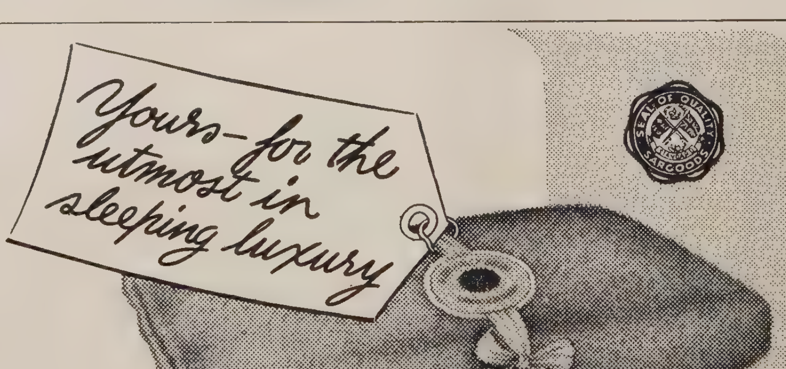
Its Academy for Accuracy

The pattern that's plainly marked!

Full instructions are marked on every piece. You're sure to make a success of your dressmaking with

Academy
PATTERNS

OBTAINABLE FROM LEADING STORES THROUGHOUT NEW ZEALAND


Yours—for the utmost in sleeping luxury
SEAL OF QUALITY SARGOODS

KEEP ASKING FOR WORLD RENOWNED

Onehunga

BLANKETS

Onehunga

DISTRIBUTED THROUGHOUT N.Z.
BY SARGOOD SON & EWEN LTD

to produce corms of flowering size for the following year. They should therefore be planted as early as July or August, provided the soil is in suitable condition for working and that it is not too wet. Cormlets may be sown in drills 1in. to 2in. deep and with 1in. between the cormlets.

Subsequent Cultivation

Gladioli do not compete well with weeds, especially during dry weather, so the hoe should be used frequently between the plants and rows to keep the surface loose and to prevent weeds developing. Where staking is not done the soil may be drawn up to the gladioli in the rows to give them added support, but care must be taken to see that the soil is not moved so much that roots are exposed.

Staking

In sheltered situations gladioli will not require staking. Where high winds are likely it is best to stake them, and this should be done not later than when the top of the flower spike is showing above the foliage. The stakes should be driven well into the ground at least 3in. away from the corm and the stem tied 12in. to 18in. above the ground and again immediately below the bottom flower when it has begun to develop. In very windy districts it is wise also to put a loose tie around the flower spike, but this tie must be sufficiently loose so that it can be moved up or down the stake as required.

Watering and Feeding

Where the soil is deep and reasonably well supplied with humus it should not normally be necessary to water gladioli except in the driest periods, when it is better to give the plants a thorough soaking now and then than a light sprinkling with water every day. Liquid manure, well diluted, can be used to some advantage once a fortnight. As an alternative a topdressing of equal parts of sulphate of ammonia and superphosphate can be applied at the rate of ½oz. to a square yard and watered in.

The soil should be cultivated with a hoe as soon as possible after each watering to prevent the surface from caking. Watering is not necessary after the flowers have faded.

Lifting, Drying off, and Storing

Most bulbous plants should not be lifted until the leaves have completely died down, but this does not apply to gladioli. This is possibly because the roots of gladioli die off some considerable time before the leaves. Gladioli lift in much better condition if dug immediately the leaves show a marked change toward yellowing and brown, usually 6 to 8 weeks after flowering. Many of the cormlets become detached and remain in the ground if lifting is done very late.

The lifted plants are best spread out in a single layer in shallow boxes or trays, a separate container being used for each variety.

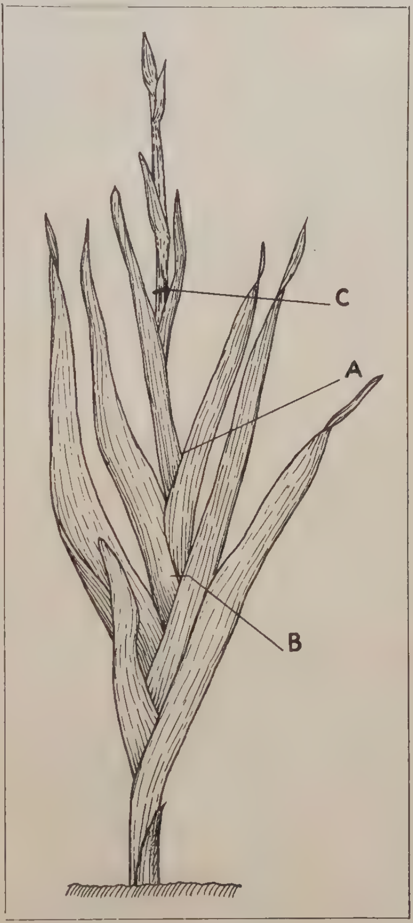
It is usual to cut the leaves off an inch or two above the corm at the time of lifting. Drying of the plants should be done in a shaded place and it may be several weeks before the corms are dry enough to be stripped of foliage and stored away. Dryness or crispness of the husks is usually taken as an indication that the corms are dry enough for storage.

A preliminary picking over for diseased corms can now be made and all bad specimens should be destroyed. It is not a good policy to skin the corms at this stage, as they are apt to shrivel during storage.

The corms should be stored in a cool, dry, airy, and preferably frost-free shed. They are liable to rot if stored in a moist place and if they are stored in a warm place they are apt to sprout too soon or to shrivel and die.

Diseases and Pests

Gladioli corms are attacked by quite a number of diseases, many of which have similar symptoms.



When cutting flower spikes insert a narrow-bladed knife at (A), run it down along the side of the stem to (B), turn it sideways, and cut through the flower stem. Then withdraw the spike without tearing the leaves. This ensures a long-stemmed flower with minimum damage to the leaf system. If left to flower in the garden, each spike should be cut off at (C) when the last flower has faded, all leaves being left intact.

Scab or neck rot (*Bacterium marginatum* McGull.): The symptoms are stripes or red-brown spots on the leaves, which later split and show burnt-out scabs. The inner foliage may rot at ground level. The husks of infected corms appear charred, and rounded, shallow, brownish depressions or large, irregular pits surrounded by raised margins appear in the flesh of the corm.

Basal rot (*Fusarium oxysporum* Schlecht): Affected plants sometimes turn yellow and die, but the attack is often confined to the corm during storage, when small reddish brown spots appear and grow into large circular lesions which are marked by concentric ridges. Slightly affected corms, if planted, produce stunted plants and fail to flower. The disease is carried over from season to season both on the corms and in the soil.

Hard rot (*Septoria gladioli* Pass.): Minute brown or purple spots appear on the leaves. The centres of the spots later turn grey and sometimes fall out. Spores fall from the leaves or are washed down by rain through the soil to the corms, which may also become infected. Large dark or reddish brown sunken lesions are produced on the corms, which may become hard and shrivelled. Corm infections are not apparent until after husking.

For control of these diseases avoid growing gladioli more than 1 year in the same place; destroy badly infected plants and corms; dip corms in acidulated mercuric chloride 1 part to 1000 parts of water or one of the proprietary dips.

Mosaic is a virus disease of some seriousness. The symptoms are light-green mottling, especially of the young leaves, and abnormal breaking or flecking of flower colour. The corms may produce warts and be small. Plants showing any of these symptoms should be destroyed.

Thrips are probably the most serious pest of gladioli in New Zealand. The insects, which attack a variety of garden plants, puncture the leaves and petals to obtain the cell sap on which they feed. Characteristic silvery brown scurf appears on the surface of the parts attacked. The insects are delicate, and heavy syringing or hosing 2 or 3 times a week has often produced good results, as the insects die within a short time after being knocked off the plants. They may be controlled by sprays, usually made up by dissolving 2oz. of soft soap in a little hot water and adding it to 1 fl. oz. of nicotine sulphate and 2 fl. oz. of summer oil emulsion in 4 gallons of water. This spray should be repeated at fortnightly intervals until the thrips have disappeared. D.D.T. wettable powder (50 per cent.) may be used as a spray, 1oz. of powder to 5 gallons of water being used. D.D.T. dusts (1 per cent. to 3 per cent.), applied to the plants when they are still moist with dew, have been reported to produce good results. Dusting of stored corms with D.D.T. is effective in controlling thrips during storage.

Aphides are known to attack gladioli on frequent occasions, but they are not to be considered a serious pest. They can be conveniently controlled with nicotine sulphate used at 1 part in 800 parts of water plus 2oz. of soft soap to each 4 gallons of water as a spreader.

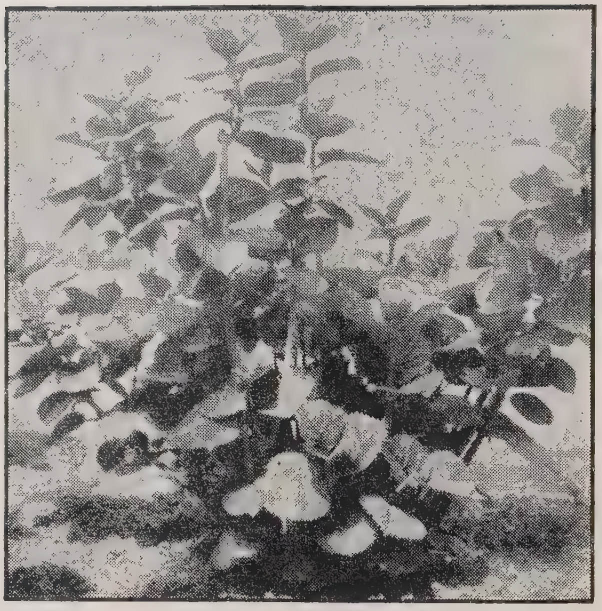
Annuals of the hardier types can be sown in open beds in September if the soil is not still too wet. The top few inches of soil should be cultivated, all lumps broken down, the soil trodden fairly firm, and the surface raked until it is uniform. Seed is far better sown too thinly than too thickly. An ⅛in. sieve can be used to spread a light covering of soil over the seeds; not more than 4 times as thick as the diameter of the seeds. For satisfactory results the seed-bed must be firm. Among the many annuals that can be treated thus are alyssum, marigolds, candytuft, cornflowers, clarkias, godetias, cosmos, larkspur, and night-scented stocks.

Bedding plants raised from earlier sowings of seed can be planted out in September in most districts, though where late frosts are likely such tender types as salvias and zinnias should not be planted out until the following month. Bushy plants with plenty of strong, green foliage are the best for bedding, and any flowers or buds present should be cut off to encourage branching and better flowering. Plants that have been in their boxes too long tend to become long and spindly and have yellowed foliage as a result of partial starvation. Such plants are never satisfactory.

Bulbs which have flowered early in the season may still carry a mass of foliage which is perhaps a little untidy, but the gardener should not yield to the temptation to cut it off. To do so is to deprive the bulbs of food which is necessary to complete development and can result only in smaller bulbs and poorer flowering next season. In herbaceous borders the masses of bulb foliage can be made tidy by tying the leaves into neat bunches.

Chrysanthemums can now be lifted and divided and root pieces replanted. Cuttings may be taken and set in sand in a cold frame to root. A cutting should be about 3in. to 4in. long., have the lower leaves removed to reduce transpiration, and be cut cleanly at the base immediately below a node or point of origin of a leaf. Cuttings should be kept moist at all times and be shaded from bright sunlight. After about 3 weeks the buds at the tips begin to produce new green leaves, and this can be taken as an indication that root formation is well advanced. When this stage is reached the shading should be removed and the lid of the frame opened up or taken off. Shortly after that the plants may be potted up or planted straight out into the borders.

Dahlias which were boxed for starting in August should be producing shoots around the necks of the tubers the following month. When these shoots are growing well the plants may be increased in either of two ways: The clumps of tubers can be divided carefully by pulling them apart, care being taken to ensure that there is a healthy shoot attached to each piece of tuber, or plants can be propagated readily from cuttings. A shoot for a cutting should be cut off immediately below a pair of leaves about 3in. from the tip, the lower leaves removed, and the cuttings inserted 1in. deep in finely sieved river sand in boxes and as close together as they will go without being crushed. The boxes should be placed in a greenhouse or cold frame for the cuttings to root. In most districts the cuttings can safely be planted directly into the borders as soon as they have rooted well.



A recently pruned hydrangea, showing how the old flowering stems from last season have been removed, and how all new shoots are untouched.

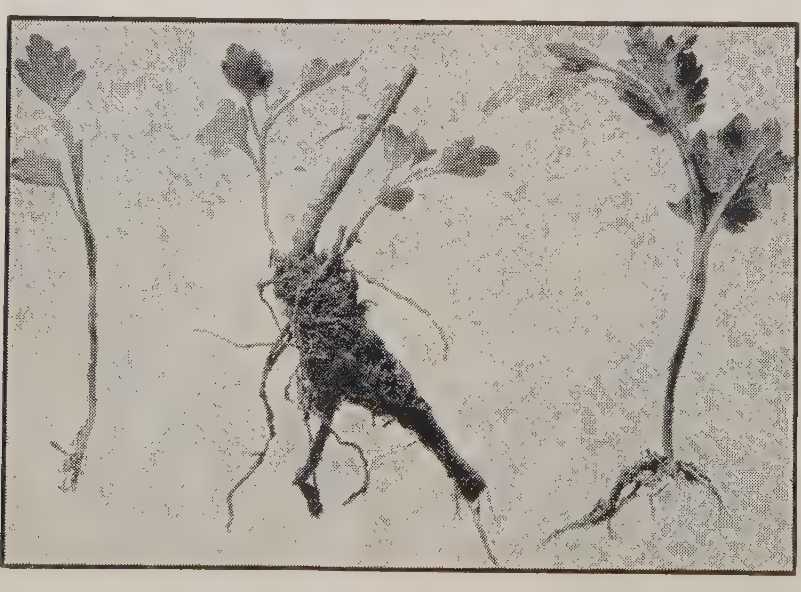
Herbaceous perennials often throw up a great number of shoots at this time of year, and if all these are allowed to grow, only a mediocre show of flowers can be expected. The shoots should be thinned out severely until only a few remain. All planting of new perennials should be completed in September.

Hydrangeas should be pruned now in cold districts or where the work was not done during autumn. All last season's flowering stems should be cut out and all new shoots left uncut, as the new flower buds are borne at the tips of these. Two handfuls of blood and bone scattered about the roots of each of the bushes in September should prove beneficial. It should be forked in very lightly with a hand fork.

Lawns should be given their spring dressing of fertiliser during September. The best dressing is a mixture consisting of 3 parts by weight of sulphate of ammonia, 1 part of superphosphate, and 1 part of sulphate of iron applied at the rate of 1oz. per square yard.

Pot plants indoors or in a greenhouse should receive attention now. A plant in need of new soil can be removed from the pot, the crocking material being taken away from the base, and as much soil as possible being scraped away without damaging the roots too greatly. The plant can be repotted into a pot of the same size or only very slightly larger. Where the need for repotting is not so great the top inch or two of soil can be scratched away and emptied out and fresh potting soil substituted.

Rose pruning will now have been completed in all districts, and the beds should be given a topdressing of well-rotted manure, compost, or leaf mould to help retain moisture during summer.



Chrysanthemums may now be lifted and divided into pieces as shown. Cuttings may now be taken in the manner described in the text

Pleasanter Ironing Days

"IRONING is a process by which is produced a smooth, wrinkle-free appearance on woven or felted materials and accomplished by some type of iron". That is a dictionary definition, but to most housewives ironing is a process by which they become hot, tired, and eventually anything but wrinkle free. The following article by Maud B. Strain, Field Officer in Rural Sociology, Department of Agriculture, Dunedin, suggests methods of overcoming the unattractiveness of this chore and making it almost a time of relaxation.

THE forerunner of the modern iron was merely a conveniently shaped piece of solid metal heated from some external source. This obviously had limitations: The external source, the time, and the place were not always synchronised, or the temperature induced by the external source became unbearable in hot weather. The old-style flat irons are a good example of this type. Made of solid metal weighing up to 6lb. they were usually in sets of three, two being heated while the third was in use. To obviate the main difficulty, the external source of heat, the iron with self-contained heating unit was developed, an early example of this being the charcoal iron used by the early settlers. In this iron, which had a chimney, a few embers were placed and it was then filled with charcoal and blown with bellows till the contents were a glowing mass. When it cooled more charcoal was added and the bellows were again applied.

Later came the gas iron, an improvement on the charcoal iron in that it had a constant source of heat controlled simply by the gas tap but somewhat unwieldy because of the gas tube attached. It was displaced by the electric iron essentially the same as it is today.

Electric Irons

The electric iron is almost universal wherever there is electric power, because of its low cost, its satisfactory performance, and the time and labour it saves. It is wise to buy the best iron available because a good electric iron has a long life and requires little maintenance, its initial cost spread over a number of years amounts to an annual expense of only a few shillings, and its operating costs are low. The sole, the ironing surface, should be flat and well polished; probably the best construction consists of a machined, cast-iron sole with heavy chromium plating. It should have a decided point at the front for entering small places in clothes, and the edges of the sole should be well bevelled to go under pleats and buttons. The iron should be well balanced, not noticeably heavier at heel or toe end, and there should be a thumb rest, preferably two so that the iron may be used in the right or left hand. Another important point is that there should be sufficient space between the handle and the metal part for the fingers to fit easily without coming in contact with the hot metal. There is a choice in weight, which allows for personal preference. It is not essential to have a heavy iron; the final result depends more on correct dampness and manipulation than on the weight of the iron. A further consideration is stability. An iron is usually rested on end or on its side and it is most important that it should maintain this position even when the ironing table is jolted slightly. The heatng point should be to the right of, and about 1ft. above, the level of the ironing table.

If the housewife is called away even for a minute or two, she should switch off the iron; an iron left unattended for long is a serious fire hazard.

Thermostatic Control

In recent years irons controlled by thermostats designed to maintain five or more different temperatures have been available. A heat selector dial with pointer showing the correct heat for ironing art silk, silk, wool, cotton, and linen may be situated on, or under, the handle and there is sometimes a pilot light indicating whether the iron is on or off. These are excellent while they function correctly, but it is true of this type that the iron is only as good as its thermostat. If this should give trouble, there are sometimes replacement difficulties; hence it is advisable to make sure that replacements are available before making a purchase. Non-thermostatic irons, which are less expensive and complicated and depend on the intelligence of the user rather than on mechanical ingenuity, will last for many years.

Steam Iron

Now available is an electric steam iron, which is intended to simplify the pressing of clothes by eliminating the need for the customary wet cloth. It is somewhat

HEADING PHOTOGRAPH: Convenient arrangement for ironing. Note the support attached to the ironing board for keeping the cord from dragging and the large-capacity airing stand.

4961

2 REASONS why you should choose *FRIGIDAIRE

the 18 cu. ft
ALL STEEL
FRIGIDAIRE

Left.

The 18 cu. ft. Frigidaire offers compact size with ample refrigerated storage space for large households and farm use. Incorporated are all the Frigidaire features to assure convenience and efficiency . . . These include **large super freezer—fully adjustable shelves—convenient meat rail—adjustable cold control—"Quickube" ice trays—Genuine Frigidaire two cylinder valve-in-head compressor body.**

Right.

The 7.4 cu. ft. Frigidaire—the maximum of refrigerated space in a minimum overall size. Includes **Large super freezer,** holding 19.2 lbs. of frozen food or ice cream—**Meat Tender,** keeping meat separate and in perfect condition. **Vegetable Hydrator,** assures vegetables always kept crisp and fresh—**"Quickube" ice trays,** exclusive to Frigidaire, with easily removed trays in which cubes pop out at the pull of a lever.

the 7·4 cu. ft
ALL STEEL
FRIGIDAIRE

WORLD FAMOUS "METER-MISER"

In the 7.4 cu. ft. model—the sealed unit "Meter-Miser", exclusive to Frigidaire—simplest cold-making mechanism ever made—Guaranteed for 5 years.

Distributed by

FRIGIDAIRE DIVISION OF GENERAL MOTORS NEW ZEALAND LIMITED.

Through a New Zealand-Wide Network of Authorised Frigidaire Dealers bigger though no heavier than an ordinary electric iron. A hollow inside is filled with water, which is converted into steam by the heat of the iron. In the sole of the iron is a central, circular channel with three small channels running one in the direction of the toe and one toward each corner of the heel. Steam from inside issues through three small outlets at the beginning of each radiating channel and thus provides a cushion of steam. By the turning of a lever which directs the steam through a small escape outlet on the front the iron may be used as a means of steaming velvet or fur.

This type of iron is handy when dressmaking, because as a damp cloth is not required, it may be used directly on the wrong side of the fabric, thereby making it possible to see what is being done instead of having the fabric hidden by the damp cloth.

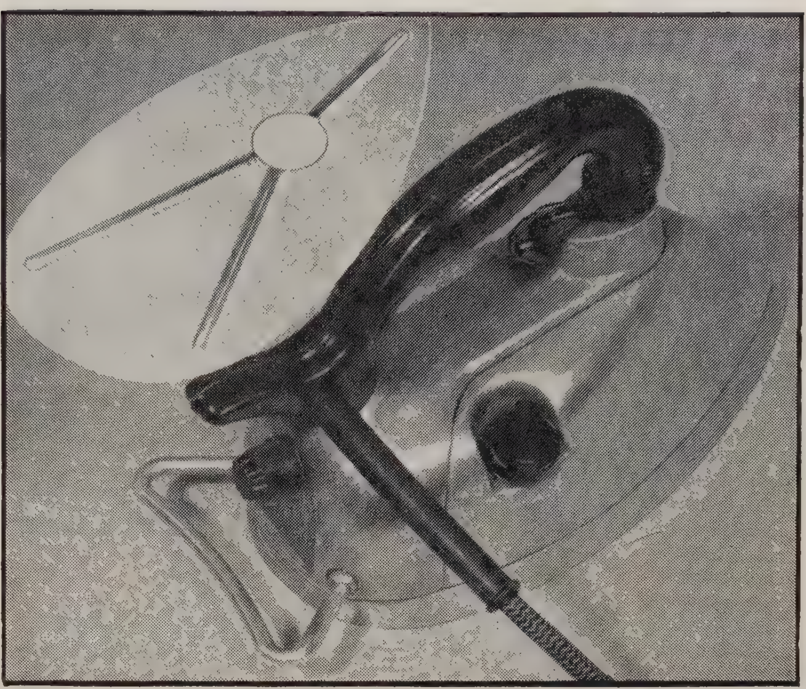
Electric steam irons have special uses, but are more likely to be used in conjunction with, rather than in place of, the common electric iron, though they can be used as an ordinary iron.

Travelling Irons

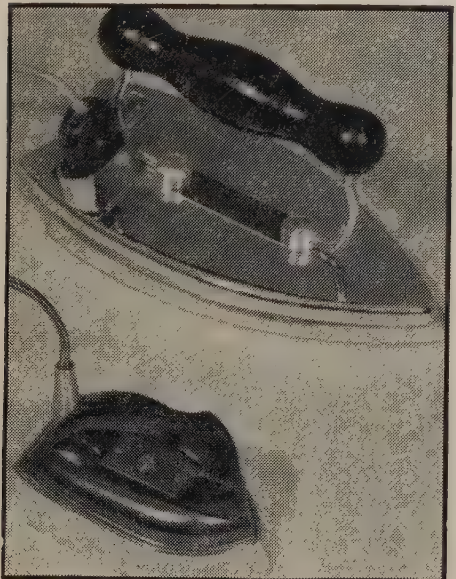
It is often necessary during holidays or when travelling to freshen up a blouse or light frock which has become creased, but irons are not always available when and where they are wanted. For such special circumstances travelling irons have been designed. They are very compact—about 5in. long, 2 to 2½in. wide, and about 3in. high—and fit with flex into a leather container with a slide fastener. One point to watch is that there is sufficient length of flex, as light points are sometimes fairly high. It is comparatively inexpensive and very handy for the purpose for which it is intended—to freshen up already ironed articles.

One Disadvantage

All the electric irons mentioned share one disadvantage; they have to be worked by hand, usually necessitating long periods of standing at the ironing board, especially during electricity shortages, when people are urged to do all their ironing at the one time.



Steam iron, showing (inset) channels in sole plate.



Two types of travelling iron.

Ironers

Statisticians have worked out from tests that a woman lifts a hand iron 1000 to 2000 times in doing an average ironing; her ironing arm travels up to 5 miles every ironing day. The ironers now available reduce the expenditure of much of this energy. Speed and efficiency of operation, the ease with which they can handle large and bulky articles, and the fact that the operator can remain seated are the main advantages of these ironers. There are two types of electric ironers:—

Rotary ironers, where a circular roller—the ironing board—revolves beneath an electrically heated shoe—the iron—shaped to fit the roller.

Flat-bed or press-board types, which consist essentially of a stationary flat table with rounded edges—the ironing board—with a simliarly shaped metal press—the iron—hinged in an inverted position above the ironing board so that it can be brought down upon the article spread out on the ironing cloth.

Rotary Types

The rotary models may again be divided into two classes. First is that used in conjunction with a washing machine and attached in place of the wringer, thus making use of the washing machine motor. This is less convenient than a detached ironer and there is little or no support for the articles being ironed, which makes manipulation more difficult. However, this type is cheaper than the independent unit.

The second type of rotary ironer is a self-contained unit and may be used wherever there is a convenient plug. The rotary models for household use depend on a rotating ironing board which moves the articles to be ironed over the ironing surface, the reverse of the procedure in hand ironing. The ironing blanket and cloth are wound round a cylinder which is rotated by an electric motor. The cylinder is free at one end so that articles may be ironed round the end. The ironing surface is usually the same length as the cylinder and during the process of ironing is in contact with approximately one fifth of the area of the cylinder. The ironing "shoe" is hollow and contains an electric heating element. The latest models are thermostatically controlled, so that if they are forgotten, they cannot overheat and become "blued".

In use the cylinder and shoe are pressed together or separated as required and these operations are usually carried out by the motor through the use of appropriate levers. This type is, in principle, the same as the commercial laundry "calendar" and is eminently suitable for flat work, for example, household linen and personal clothing of simple construction such as vests, pyjama trousers, and undershorts.

The beginner will make a success of all the flat pieces, pillow cases, sheets, tablecloths, and pieces which can be treated as flat (vests, undershorts, etc.). These offer no difficulties, being run through double, the last-mentioned articles being opened out and the body portions slipped over the end of the roller and ironed singly. The roller revolves so that garments pass under the heated metal shoe, which presses on and irons the work. The roller may be stopped temporarily to press particular parts. Skill with difficult pieces like shirts will come with practice; progress may be slow while the technique is being learnt, but once it is mastered the operator will never willingly revert to use of the hand iron.

Preliminary work: With rotary ironing, as with all methods of ironing, proper preparation of the clothes allows the work to be done more easily; the right amount of dampening will give the best results—clothes too wet require too much heat for drying out and clothes too dry will not be free of wrinkles. Orderly arrangement of dampened clothes in the basket is important. Rayons and light fabrics requiring a low temperature could be placed together and ironed first; afterward the temperature could be raised for cottons and linens, or they may be ironed last, making use of the cooling iron. The shoe heats up and cools down so rapidly that running a few tea towels through after the heat has been turned off will soon use up the effective heat. The main point is that if the articles are arranged in a definite order, time will not be lost rummaging in the ironing basket for items that require similar temperatures. Several articles of the same type done one after the other are handled more speedily than articles which each require different manipulation. Domes, hooks, pins, or buttons should not be run through the ironer, as they are likely to scratch the surface of the shoe. Embroidery may have to be finished by hand to give a raised effect.

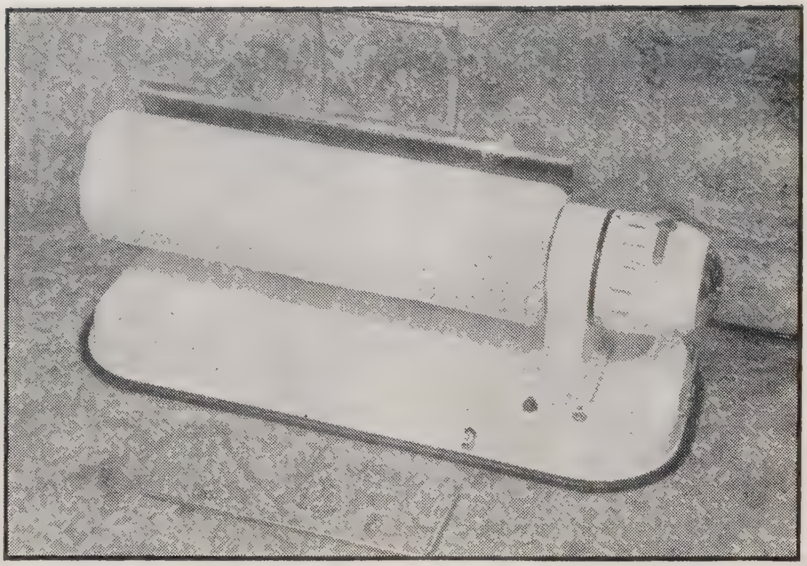
Flat-bed Models

The flat-bed ironer has a flat bed of the same shape as an ordinary ironing board, but smaller. It is padded and covered with an ironing sheet and is not absolutely flat, being rounded at the edges. The iron is shaped to fit exactly and when brought down on the ironing board exerts a pressure of over 400lb. There are two switches on the iron, each controlling half the area so that heat need not be wasted when small articles are being ironed. In principle the iron is similar to commercial laundry presses, but there are no special accessories for ironing sleeves and collars; however, with a little manipulation these can be done successfully. In commercial laundries where large numbers of similar articles have to be processed presses are made of varying shapes, each corresponding with the article for which the press is intended (for example, the press for stiff-fronted shirts is the same shape as the starched portion of the shirt).

The possibilities of the flat-bed type are worth investigating before an ironer is purchased. As it requires no motor, it is slightly cheaper than the rotary type. The pressure exerted by the shoe on the roller or board is usually rather greater with the flat-bed type than with the roller, where uniformity of pressure is difficult to secure unless the shoe is supported with sufficient rigidity to maintain alignment with the roller at all times.

With each type of ironer some hand finishing of parts which cannot be ironed satisfactorily by machine may be necessary; however, the production of well-finished articles is possible with either machine when they are used correctly.

The most obvious advantage of an ironing machine is that the housewife can do the ironing sitting down. If the kitchen table is too high for comfortable working from an ordinary chair, a stool, which should be standard equipment in every kitchen, will be found most satisfactory, with the clothes basket placed at a convenient height alongside.


Rotary-type household ironer.

Care and Maintenance

An ironer requires very little attention. The machine should be allowed to cool completely with the shoe away from the roller before it is closed and put away. It should be covered with a clean cloth to keep dust and smuts from settling on the working parts and the table should be dusted before use and kept perfectly clean. The roll cover or ironing sheet should be removed and laundered whenever it becomes scorched or soiled.

The motor should be greased every 12 months. This can easily be done at home, full instructions usually being supplied with the machine.

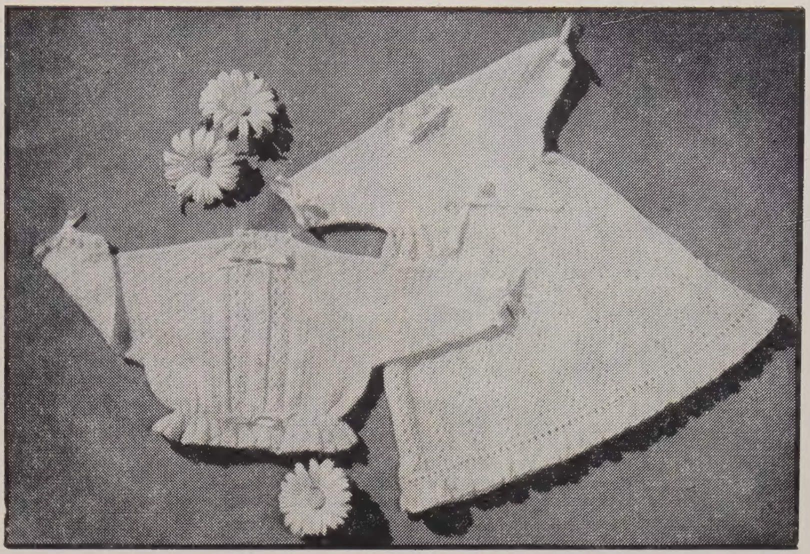
Very bulky articles should not be forced between the shoe and the cylinder, as undue pressure on the cylinder causes excessive wear on the bearings. The shoe may be cleaned by using a damp cloth and any mild household cleaner to remove starch or other substance adhering to the surface.

Electric ironers have many points to recommend them—they save time and effort, are economical to run, and require a minimum of attention—but initial cost is high. It may well be argued that, in general, these machines do not give sufficient advantage over hand ironing to justify their cost. However, where time and effort are the main considerations an ironer soon pays for itself by providing opportunity, and conserving energy, for other household tasks.

Flat-bed type household ironer.

Baby's Dress and Matinee Jacket

ALL mothers of baby girls will consider the dress and matinee jacket illustrated here beautiful and useful. Instructions for making them are given in the following article. Materials required are: 5oz. of 3-ply wool; 2 No. 9 and 2 No. 12 knitting needles; 3½yds. of baby ribbon; 8 buttons.



MEASUREMENTS are: Frock, length 16in., width all round under arms 18in.; coat, length 8in., chest 20in.

Tension: 7 st. to 1in.

Abbreviations: K., knit; p., purl; st., stitch(es); rep., repeat; beg., beginning; dec., decrease; inc., increase; patt., pattern; sl., slip; tog., together; g.st., garter stitch; p.s.s.o., pass slip stitch over; w.o.n., wool over needle; wl.fwd., wool forward; w.r.n., wool round needle; cont., continue; st.st., stocking stitch.

The Dress

The Front

Using No. 9 needles cast on 293 st.

First row: P. 3, * k. 7, p. 3. Rep. from * to end. Second row: K. 3, * p. 7, k. 3. Rep. from * to end. Third row: P. 3, * k. 2, sl. 1, k. 2 tog., p.s.s.o., k. 2, p. 3. Rep. from * to end (235 st.). Fourth row: K. 3, * p. 5, k. 3. Rep. from * to end. Fifth row: P. 3, * k. 1, sl. 1, k. 2 tog., p.s.s.o., k. 1, p. 3. Rep. from * to end (177 st.). Sixth row: K. 3, * p. 3, k. 3. Rep. from * to end. Seventh row: P. 3, * sl. 1, k. 2 tog., p.s.s.o., p. 3. Rep. from * to end (119 st.). Eighth row: K. 3, * p. 1, k. 3. Rep. from * to end. Ninth row: K. Tenth row: K., inc. 1 st. in last st. (120 st.). Eleventh row: K. 1, * wl.fwd., k. 2 tog. Rep. from * to last st., k. 1. Twelfth row: K.

Change to the following patt.: First row: K. 3, * p. 5, k. 5. Rep. from * to end, finishing p. 5, k. 2. Second row: P. 2, * k. 2 tog., wl.fwd., k. 1, wl.fwd., sl. 1, k. 1, p.s.s.o., p. 5. Rep. from * to end, finishing p. 3 instead of p. 5. Third row: As first row. Fourth row: P. 2, * w.o.n., sl. 1, k. 1, p.s.s.o., k. 1, k. 2 tog., w.r.n., p. 5. Rep. from * to end, finishing p. 3 instead of p. 5. Fifth row: K. 3, * k. into back of loop, p. 3, k. into back of loop, k. 5. Rep. from * to end, finishing k. 2 instead of k. 5. Sixth row: P. 2, * k. 1, sl. 1, k. 2 tog., p.s.s.o., k. 1, p. 5. Rep. from *, finishing p. 3 instead of p. 5. Seventh row: K. 3, * p. 1, p. 1 st. into the thread between the last and next st., p. 1, p. 1 st. into the thread between the last and next st., p. 1, k. 5. Rep. from * to end, finishing k. 2 instead of k. 5. Rep. the last 4 rows until work measures 5½in. from beg., finishing after a 7th patt. row, then make a dec. row.

Next row: P. 2, * w.o.n., sl. 1, k. 1, p.s.s.o., k. 1, k. 2 tog., w.r.n., p 2, p 2 tog., p. 1. Rep. from * to end, finishing patt. 5, p. 2 tog., p. 1 (108 st.). Now cont. in patt., but there will be only 4 st. in g.st. between lace bands and finishing p. 2 instead of p. 3. Cont. straight until work measures 8½in., finishing after a 7th patt. row. Make another dec. row.

Next row: P. 2 tog., * w.o.n., sl. 1, k. 1, p.s.s.o., k. 1, k. 2 tog., w.r.n., p. 2 tog., p. 2. Rep. from * to end, finishing patt. 5, p. 2 (96 st.). Work without dec. with 1 st. less in g.st. and 1 less at beg. of rows until front measures 11½in.

Change to No. 12 needles.

First row: * K. 1, k. 2 tog. Rep. from * to end (64 st.). Second row: K. Third row: K. 1, * wl.fwd., k. 2 tog. Rep. from * to last st., k. 1. Fourth row: K. to end, k. twice into last st. (65 st.).

Change to following patt.:—

First row: K. 2, * p. 1, k. 3. Rep. from * finishing k. 2 instead of k. 3. Second row: P. Third row: * P. 1, k. 3. Rep. from * to last st., p. 1. Fourth row: P. Rep. these 4 rows until work measures 1in. from waist, dec. row, ending with a p. row. Change to No. 9 needles and shape for sleeves, keeping continuity of patt.

Next row: Cast on 2 st., work in patt. to last st., k. twice into last st.; rep. this row 7 times (89 st.).

Work 1½in. in patt. across all st., ending with a p. row.

Shaping the neck—Next row: Patt. 39, cast off 11 loosely, patt. to end. Work 8 rows in patt. on last set of st., dec. 1 st. at neck edge on each row. Work 1 row without shaping. Leave 31 st. on a spare needle. Rejoin wool to remaining stitches at neck edge and work as given for first side.

The Back

Work as given for front to row after holes at waist, but dec. 1 st. at end of row instead of inc. (63 st.).

Divide for back opening—Next row: Patt. 29 st. in spot patt., k. 4, turn, leaving remaining stitches on a spare needle. Next row: K. 4, p. to end. Work in patt. as for front bodice, with 4 st. in g.st. at border for ½in., ending with a p. row.

Next row: Patt. to last 4 st., k. 1, wl.fwd., k. 2 tog., k. 1. Cont. in patt. with g.st. border until work measures 1in. from waist dec. row, ending with a p. row. Change to No. 9 needles and shape for sleeve, keeping continuity of patt., making a second buttonhole 1in. from first one.

Next row: Cast on 2 st., patt. to last 4 st., k. 4. Next row: K. 4, p. to last st., p. twice into last st. Rep. these 2 rows three times (45 st.). Now cont. without shaping, making 2 more buttonholes at 1in. intervals for 2in., ending at neck edge.

Shaping the neck: Cast off 10 st., p. to end. Second row: Patt. until 2 st. remain, k. 2 tog. Third row: Cast off 2, p. to end. Fourth row: As 2nd row. Leave remaining 31 st. on st. holder. Rejoin wool at centre back and cast on 4 st. for underwrap. Now cont. in patt. with 4 underwrap st. in g.st. for 1in., ending at side edge. Change to No. 9 needles and work sleeve shapings as for first side, reversing patt. and p. rows. Now work straight on 45 st. for 2in., ending at neck edge. Shape neck to match other side. Now place sets of shoulder st. together and graft neatly.

The Neck Border

With right side of work facing and using No. 12 needles k. up to 50 st. evenly round neck edge.

First row: K. to end. Second row: K. 1, * wl.fwd., k. 2 tog. Rep. from * to last st., k. 1. Third row: K. to end. Cast off.

Sleeve Borders

With right side of work facing and using No. 12 needles k. up 40 st. evenly along edge of sleeve. Now work as for neck border for 3 rows and cast off.

To Make Up

Press work on wrong side with a warm iron and damp cloth. Sew up sleeve and side seams. Sew cast-on edge of underwrap at back of g.st. border and sew on buttons. Press all seams.

The Jacket

The Right Front

Using No. 9 needles, cast on 83 st. and work in bell patt. as for frock for first 8 rows (35 st.).

Next row: Cast on 4 st. at beg. of next row, k. to end. Tenth row: K. Eleventh row: K. 4, * wl.fwd., k. 2 tog.; rep. from * to last st., k. 1. Twelfth row: K. 2 tog., k. to end (38 st.).

Now change to the following patt:—

First row: K. 6, p. 5, k. 2, then work 25 st. in spot patt. Second row: Patt. 25, k. 2 tog., wl.fwd., k. 1, wl.fwd., sl.

192—BABY'S JACKET . . .

1, k. 1, p.s.s.o., p. 2, k. 4. Third row: As 1st row. Now cont. in patt. with 4 st. in g.st. for border, 5 lace patt. st., with 2 st. either side in st.st. (p. side right side) and 25 st. in spot patt. until work measures 1¾in. from beg., finishing at front edge.

Next row: K. 2, wl.fwd., k. 2 tog., patt. to end. Cont. in patt., making 3 more buttonholes at 1½in. intervals, but when work measures 3½in. from beg. shape sleeve.

Next row: Cast on 2 st., work to end. Next row: Work to last st., inc. in last st. Rep. these 2 rows until there are 68 st. on needle. Cont. without shaping until work measures 6½in. ending at front edge. (There should be ¼in. above last buttonhole.)

Shaping the neck: Cont. in patt., cast off 5 st. at beg. of next row, then dec. 1 st. at this same edge on every row until 56 st. remain. Work without shaping until front measures 8in., finishing after a patt. row. Leave st. on spare needle.

The Left Front

Using No. 9 needles cast on 83 st. and work as for right front until there are 38 st. Next row: Spot patt. for 25 st., k. 2, p. 5, k. 6. Next row: K. 4, lace patt. 9 st., spot patt. to end. Now cont. to match right front omitting buttonholes and reversing all shapings. Leave on spare needle.

The Back

Using No. 9 needles, cast on 183 st. and work bell frill and ridge as for frock for 12 rows, but k. twice into last st. of 12th row (77 st.). Now change to spot patt. and when work measures 3½in. from beg. shape sleeve.

Next row: Cast on 2, work to last st., inc. in last st. Rep. this row until there are 137 st. Cont. straight until work measures 8in., finishing after a p. row.

Now take 56 st. of right front and graft first 56 st. from back together, cast off 25 back st., then graft remaining 56 st. to left front st.

The Neck Border

With right side of work facing, and using No. 12 needles, k. up to 66 st. evenly round neck edge and work in patt. as for frock border. Cast off.

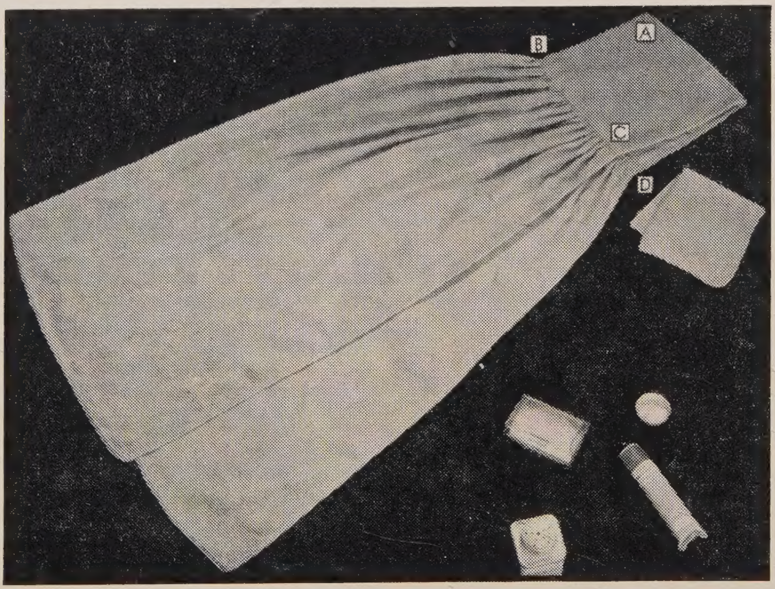
Sleeve Borders

Work as for frock sleeve borders.

To Make up

Press work with a warm iron and damp cloth. Sew up sleeve and side seams. Sew on buttons to correspond with buttonholes. Thread ribbon through holes. Press all seams.

Towelling Hood for a Baby



[*Sparrow Industrial Pictures Ltd. photo.*

TO protect a new baby from chilling after a bath, as soon as he is out of the bath wrap him in a towelling hood. The hood keeps the head and body warm while the baby is being dried.

To make the hood use 1yd. of 36in. towelling or 1 2-3yds. of 16in. For the head cover cut from one end of the towelling a piece 8in. x 16in. Fold the piece in halves to form an 8in. square and stitch one side from the folded edge to the raw edge AB, using a ½in. seam allowance.

Trim the remainder of the towelling to an oblong measuring 36in. by 28in. Gather one end to fit the lower edge of the head cover and sew the head and body cover together along CBD, using a ½in. seam allowance.

For 16in. towelling sew together two strips 26in. long along the selvedge to form the cape, using the 8in. strip cut off for the head cover, and make up as for 36in. material.

Finish the raw edges with crochet work or by turning a hem and blanket stitching in a pastel colour. If 36in. material is used, the piece cut off can be cut in halves to make two face cloths and finished to match the towelling hood.

—*MOLLY MACPHERSON, Field Officer in Rural Sociology,*
Department of Agriculture, Auckland

Garnishes for Soups

THOUGH there are many garnishes for soups, these dishes are served so often that it is sometimes difficult to find attractive garnishes for them. Among the most attractive are croutons, sippets, noodles, and toast in its various forms. This article describes briefly methods of making these garnishes.

Croutons

To make croutons use slices of bread ⅓ to ½in. thick. Trim the crusts from the slices and spread the slices thinly with butter. Cut them into narrow strips, ⅓ to ½in. wide, and then cut the strips into cubes. Brown the cubes in a hot oven. Serve them with cream soup.

Sippets

For sippets slices of stale bread ½in. thick and ¼ cup of milk are required. Cut the slices into cubes and drop the cubes into the milk. Remove the cubes from the milk with a perforated spoon and fry them in deep fat. Serve them with pea soup. Quite a large number of sippets can be prepared at a time and those not required immediately can be stored in an airtight jar.

Noodles

To make noodles beat ½ teaspoon of salt lightly into 1 or 2 egg yolks. Stir in enough flour to make a very stiff dough and knead the dough until it is smooth. Roll it as thinly as possible on a lightly floured board. Cover the dough and let it stand for ½ hour. Roll up the sheet of dough into a cylinder and with a sharp knife cut it into ⅛in. slices. Shake the slices into strips. Cut the strips into the required lengths and boil them in salted water for 20 to 25 minutes. If the water goes off the boil, the noodles will become soggy.

Another method of making noodles is to cut the dough into triangles or fancy shapes with biscuit cutters. Serve noodles with any soup which has a stock basis.

Toast

To make toast for soups use stale bread cut into slices ⅓ to ½in. thick with the crusts cut off.

Toast fingers or strips: Cut the slices of toast lengthwise into 4 strips.

Toast points: Cut the slices of toast into 4 squares and then cut each square twice diagonally.

Serve toast with either cream or stock soups.

—*NELL MACPHERSON,*
Field Officer in Rural Sociology,
Department of Agriculture,
Auckland

Printed by Blundell Bros. Ltd. (The Evening Post), Wellington—33299

Westinghouse
Cold Storage Sheds mean

QUICKER . . . SAFER HARVESTING

fruit kept perfect for DAYS * MONTHS

YOUR harvesting is quicker when you have a Westinghouse cold store because you can plan your picking with the knowledge that all the crop can be stored until you are ready to move it to market. It is quicker too, because you need no longer wait for transport or be troubled by weather. Your Westinghouse REFRIGERATION unit means controlled selling which must mean better prices each year.

After installation a thorough Westinghouse servicing plan is put into operation. No matter what the district there's a fully qualified Westinghouse Refrigeration engineer on call . . . always!

don't delay!

write NOW . . . act NOW
EVERY MONTH MISSED
means lost profits next season

THIS is an urgent reminder for all orchardists who want to reap the extra profits that come automatically from erecting a Westinghouse cool store. Now is the time to get details . . . to write for a free inspection of *your* orchard. If you delay another month you run the risk of missing out for *another* season. When Westinghouse engineers have inspected your orchard you will receive a free quotation for installing a unit which fits your requirements EXACTLY! Not too big . . . not too small. You will be surprised how little it costs to convert existing buildings or to erect a compact store to house your handy Westinghouse Recold Refrigeration equipment. Once you have it you will wonder how you ever did without it.

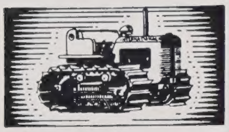
Individual Units! Designed for your orchard.
No extra cost! FREE INSPECTION!

WESTINGHOUSE ORCHARD REFRIGERATION

Quotations given *FREE* to all orchardists interested in saving waste the WESTINGHOUSE way.

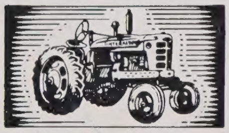
H. W. CLARKE (N.Z.) LTD.: 42-46 Cable Street, Wellington; 256 Cashel Street, Christchurch; 105 Anzac Avenue, Auckland; 28A Bridge Street, Nelson.
H. E. THOMAS LTD.: Moray Place Dunedin.

an international source of supply



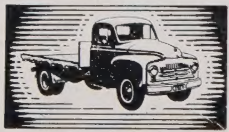
FROM U.S.A.

Crawler Tractors, Cub Tractors, Harvester Threshers, Hay Balers, Hay Choppers



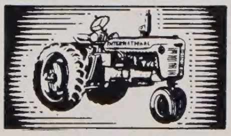
FROM ENGLAND

Hay Balers, Tractors, Green Crop Loaders



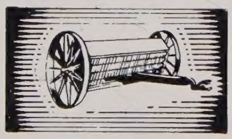
FROM AUSTRALIA

Mowers, Tractors, Disc Harrows, Potato Planters, Motor Trucks



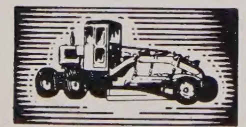
FROM FRANCE

Wheel Tractors, Field Cultivators



FROM SWEDEN

Fertilizer Distributors



FROM NEW ZEALAND

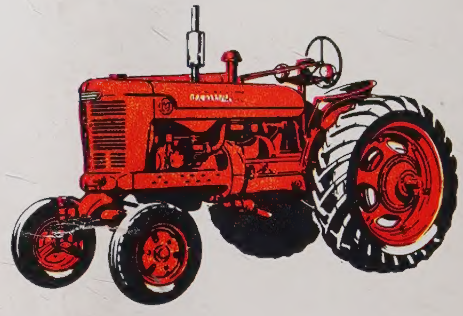
Tandem Graders, Angledozers, Loader Dozers, Wheel Loaders, Patrol Graders

POWER that's been proved in tough going, on big acreages

• •

Years of field-proving earlier models, give these tractors advantages that pay off on large farm work. Both have 40.5 B.H.P.* engines, 5 SPEEDS FORWARD, 1 Reverse. Both can handle large implements, e.g. 3/4 Furrow Ploughs. Greater working capacity speeds jobs, lowers labour costs. Inbuilt strength of construction and top grade engineering ensure economical performance, long working life. Both tractors fully backed by the after-sales service organisation of International Harvester Company of N.Z. Ltd.

* Neb. Tests No. 328 and 355.



THE FARMALL BM

For row crop and undulating work. Front and rear wheels adjustable to row widths. Wheel weights can be fitted for solid going. Like all Farmalls, the BM is equipped for hydraulic remote control and direct-attached implements. Heat indicator and radiator shutter control. The BM has the power to handle the heaviest work economically and reliably.

THE McCORMICK STANDARD AW-6

Regular general purpose tractor for hauling, driving power take-off or belt powered machinery. 4-cylinder engine features include: valves in **head**, removable cylinder sleeves, tocco-hardened crankshaft, precision-type bearings, force-feed lubrication, floating oil screen, large air, oil, fuel cleaners, extra large flywheel. Precision engineering throughout makes the AW-6 a real, long-term investment.

MAIL THIS COUPON FOR FULL FACTS

TO: INTERNATIONAL HARVESTER CO. OF N.Z. LTD.
P.O. BOX 563, CHRISTCHURCH

Please send me information on :
Farmall BM
McCormick International AW-6
(Tick Machine concerned)

NAME ....

ADDRESS ....

INTERNATIONAL HARVESTER

INTERNATIONAL HARVESTER CO. OF NEW ZEALAND LTD.
HEAD OFFICE: P.O. BOX 563, CHRISTCHURCH.

INTERNATIONAL HARVESTER

Branches at: **Auckland, Palmerston North, Wellington and Dunedin.**